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INDEX.

A

Abnormal Milking Goats .. 834
Action of the Internal Organs of Ruminants 512
Adoretus ictericus—A Queenstown Garden Trouble 163
Africander Ram, Typical .. 598
Agricultural Salt 437
Agricultural Society, Albany .. 685
Do. Paarl .. 246
Do. Port Elizabeth 694
Agricultural Society, Robertson and Montagu 371
Agricultural Society, Stellenbosch 366
Agricultural Society, Western Province 554
Agricultural Society, Worcester .. 381
Agricultural Show Fixtures -1905 32
Agricultural Show of England, 1904, Royal 207
Agricultural Shows 156
Agricultural Shows in 1905 .. 261
Agricultural Union of Cape Colony, The 797
Agriculture, The use of Lime in, by J. Lewis, M.A. 528
Air Cells of the Lungs, Causes of Rupture 326
Air Chambers on Syphons .. 435
Air Sacs, Causes of Rupture of .. 326
Albany Agricultural Society .. 685
Albany, In the District of, by F. D. MacDermott 790
Alfa-Laval Cream Separator .. 7
"Alfalfa" or Lucerne .. 157
Alleged Caterpillar (*Intonjani*) Poisoning 605
American Vines, Distribution of .. 316
Analysis of Fertilizer .. 48
Another Scourge for Stock Farmers 116
Antelopes, Suborbital Glands in the Duyker and other .. 321
Ant Heap Soils 516
Aphtha, Vesicular Stomatitis or Tongziekte in the Horse .. 753
Apples, Black Spot in 319
Apricots, Fungous Disease on .. 280
Aramon Rupestris, Hanepoot on .. 635
Araucaria at Graaff-Reinet, The .. 829
Armstrong, M.R.C.V.S., Death of Mr. 503
Arsenical Poisoning, Post-mortem appearance in 511
Artesian Waters, Surface *versus* .. 719

B

Baboons and Jackal-proof Fencing 833
Bakoor Jackal, The 122
Barkly East Show 508
Bars in Ostrich Feathers .. 437
Bathurst Show 506
"Bee Pirate" again, The .. 157
Bees, How to Tame 281
Bees, Ostriches, Moles and .. 123
Belt, Re-stocking the Heartwater .. 749
Black Spot in Apples 319
Black Wattle, Mallet Eucalypt Bark better than, by D. E. Hutchins, F.R. Met. So. .. 784
Blasting near Springs 125
Bloedpens in Lambs, Copperas and Salt for 12
Bird Guano 720
Bone Meal and Lamziekte .. 273
Bone Meal as a Preventive of Lamziekte 747
Bone Meal for Cattle 714
Boreholes, Lining 648
Boreholes, Syphons on .. 755
Bredasdorp Show 507
Buffalo, The Indian 327
Butter, etc., Cold Storage for .. 832

C

Cactus, Jointed Prickly 3, 116, 603
Cactus on Dry Lands, The .. 663
Calves, Ground-eating 139
Calves, Hairball in 721
Cape Colony, Cotton Growing in, by A. H. Roworth 679
Cape Fruit in London .. 503, 636
Cape Horse, The 317
Cape Muscat, The 116
Cape Orange, A Late 266
Cape Town Industrial Exhibition . 133
Caponising Ostriches 11
Caterpillar (*Intonjani*) Poisoning, Alleged 605
Caterpillars in Lucerne .. 13
Cattle, Bone Meal for 714
Cattle Dipping Tanks 717
Cattle Dips as Tick Destroyers .. 320
Cattle Disease, Molteno .. 273
Cattle, Fatal Indigestion in .. 436
Cattle from Cape to the Transvaal, Introduction of 640
Cattle, Loose Teeth in 601
Cattle with Common Salt, Dosing .. 754
Cause of Redwater, The Originating 830
Causes of Rupture of Air Sacs .. 326
Cereals, Manurial Experiments with, by Dr. E. A. Nobbs .. 813
Ceres Show 507
Citrus Culture Commission .. 121
Challenge, A 125
Chemical Manures for Fruit Trees .. 435
Chickens, Fine Sand in Intestines of 167
Chickens unable to escape from the Shell 757
Chronic Sore on side of Head, Horse with 831
Cockerel, Megrims in a .. 110
Codling Moth, The Eastern Province and 317
Cold Storage for Butter, etc, in transit by Rail 832
Cold Storage, Grapes in .. 504
Cold Storage of Fruit 726
Colonial-made Spray Pump, A .. 160
Colony, Locusts in the .. 255
Colony, The Hippopotamus in the 720
Common Salt, Dosing Cattle with .. 754
Competition, Egg-laying .. 748
Compulsory and Voluntary Dipping 7
Congress, Farmers' 819
Congress, Fruit Growers' .. 684
Congress, United Vine and Fruit Growers' 822
Cooper's Dip for Tapeworm in Lambs 124
Copperas and Salt for Bloedpens in Lambs 12
Correction 157
Correspondence, 116, 269, 435, 600, 717, 828
Correspondents, To 634
Cost of Jackal-proof Fencing .. 157
Cotton Growing .. 636, 751
Cotton Growing in Cape Colony, by A. H. Roworth 679
Cotton Seed for Free Distribution .. 826
Country Shows, The 506
Cream Separator, Alfa-Laval .. 7
Croft's Tincture A Challenge . 125
Crop Failure, A .. . 79
Cultivator, a New Lucerne .. 103
Curing Lucerne for Hay .. 752
Current Market Rates, 137, 293, 460, 622, 818

D

Damage caused by Sluits .. 120
Death of Mr. Armstrong, M.R.C.V.S. 503
Departmental Notices, 138, 291, 461, 623, 739
Departmental Publications, 151, 311, 496, 629, 711, 819
Destroying Ticks on Stock .. 608
Destruction of Locusts, The, by C. W. Mally, M.Sc. .. 106
Destruction of Lynx (Red Cat) .. 728
Diamond Drills, Jumper *versus* .. 602
Diamond *versus* Jumper Drilling .. 276
Digestive Organs of our Domestic Ruminants, The, by D. Hutcheon, M.R.C.V.S... .. 776
Dip, Lime and Sulphur, 271, 438, 609, 721
Dip, Lime and Sulphur as a Sheep 834
Dip, Lime and Sulphur *versus* Imported 609
Diphtheritic Roup in Poultry and Quibell's Dip 11
Dipping, Compulsory and Voluntary 7
Dipping Tanks, Cattle 717
Disease, Molteno Cattle .. 273
Disease on Apricots, Fungous .. 280
Diseases, Outbreaks of Infectious .. 265
Distribution of American Vines .. 316
District of Albany, In the, by F. D. MacDermott 790
Domestic Ruminants, The Digestive Organs of our, by D. Hutcheon, M.R.C.V.S. 776
Dongas, Sluits and 718
Dosing Cattle with Common Salt .. 754
Drift Sands, Fixing 441
Drilling, Jumper *versus* Diamond .. 276
Drills, Jumper *versus* Diamond .. 602
Drills, South African made Water . 259
Dry Lands, The Value of Cactus on 663
Ducks, Air under Skin of .. 326
Ducks, Fine Sand in Intestines of Young 167
Duyker and other Antelopes, The Suborbital Glands in the .. 321

E

Eastern Province and Codling Moth, The 317
Eastern Province Fruit Growers' Congress 69
Egg-Laying Competition .. 748
Electricity for Pumping .. 122

Enemies of the Fruit Fly, Natural, by C. P. Lounsbury .. 84
England, Royal Agricultural Show of 207
Eradication of Prickly Pear .. 17
Eradication of Scab in Sheep, 119, 600, 722, 836
Evil and Prevention of Sluits, by G. E. Dugmore 375
Exhibition, Cape Industrial Exhibition 433
Exhibition, The 220
Experiments in Victoria, Wheat .. 750
Experiment Stations 533
Experiments with Cereals, Manurial, by Dr. E. A. Nobbs .. 813
External Parasites, Fowls and .. 123
Extra-Tropical Forestry, by D. E. Hutchins, F. R. Met. Soc., 18, 171, 331, 517, 649, 759

F

Failing Orange Trees 514
Failing Pear Trees 515
Failure, A Crop 279
Farm and Veld, 11, 163, 323, 509, 641, 752
Farmer's Congress 319
Farmers' Meetings, Report of .. 319
Farriers' Licences 277
Fatal Indigestion in Cattle .. 436
Fencing, Hand Weaving Wire .. 509
Fencing, Baboons and Jackal-Proof 833
Fencing, Cost of Jackal-Proof .. 157
Fencing for Rivers and Sluits .. 163
Fertiliser, Analysis of 48
Fixing Drift Sands 441
Flies on Ostriches 8
Flood Irrigation Works at Nelspoort 828
Flood Water, Growing Lucerne with 49
Flood Waters, Utilisation of .. 3
Flood Water, Utilisation of Karroo 88
Flow of Streams, Measuring the .. 721
Fluke in Sheep 273
Fluke or Slak in Liver of Sheep, by D. Hutcheon, M.R.C.V.S. . 33
Foals, Mules Killing .. 159, 604
Forecast, Weather, by D. E. Hutchins, F. R. Met. Soc. .. 105
Forestry, Extra-Tropical, by D. E. Hutchins, F. R. Met. Soc., 18, 171, 331, 517, 649, 759
Forestry in South Africa .. 2
Fountains, Mr. W. R. Southey's .. 323
Fowls and External Parasites .. 123
Fowls, Vermin on 606
Fowl Yards, Small, by F. Arnold .. 186
Freak of Nature, A 605
Free Distribution, Cotton Seed for 826
Fruit, Cold Storage of 726
Fruit Fly, Natural Enemies of the, by C. P. Lounsbury .. 84
Fruit Fly, The 2
Fruit Growers' Congress .. 634
Fruit Growers' Congress, Eastern Province 69
Fruit Growers, Oudtshoorn .. 631
Fruit in London, Cape 636
Fruit Trees, Chemical Manure for.. 135
Fruit Trees, Netting for 2, 156
Fruit, Wine, Vegetables, etc., The Marketing of 707
Fuchsia "Sport," A 606
Fungous Disease on Apricots .. 280

G

Garden Trouble, A Queenstown .. 163
Gates, On 17
Goats, Abnormal Milking .. 831
Graaff-Reinet, The *Araucaria* at .. 829
Grafted Vines at Tokai, Sale of, 503, 751
Grahamstown Show, 1905 .. 685
Grain Harvest, The Western .. 11
Grapes in Cold Storage.. .. 504
Green Oat Silage for Milk Production, Mangels *versus* 608
Ground-Eating Calves 139
Guano, Bird.. 720

H

Hairballs in Calves 721
Hanepoot on *Aramon Rupestris* .. 635
Hand Milking Machine, An Ingenious 9
Hand Weaving Wire Fences .. 509
Hay, Curing Lucerne for .. 752
Head, Horse with Chronic Sore on Side of Head 831
Heartwater Belt, Re-Stocking the 749
Heartwater, Preventive Vaccine for, by D. Hutcheon, M.R.C.V.S. 647
Heartwater, Stockholm Tar and .. 444
Heartwater Vaccine, Dr. Purvis's.. 635
Hippopotamus in the Colony, The.. 720
Horse, Aphtha, Vesicular Stomatitis or Tongziekte in the .. 753
Horses Suitable for Military Requirements 827
Horse, The Cape 317
Horse, The South African, by a S.A. Breeder.. 578
Horse with Chronic Sore on Side of Head 831
Horticultural Assistant's Tour .. 640
Housing of Milk Cows, The .. 421

I

Igneous Dykes, Their Origin, etc., by Claude Warner 262
Imperialism, Useful 746
Imported Dip, Lime and Sulphur *versus* 441, 609
Imported Saxony Merino Rams .. 102
Indian Buffalo, The 327
Indigestion in Cattle, Fatal .. 436
Industrial Exhibition, Cape Town.. 433
Infectious Diseases, Outbreaks of .. 265
Internal Organs of Ruminants, Action of the 512

Intestines of Young Ducks and Chickens, Fine Sand in .. 167
Introduction of Cattle from Cape to the Transvaal 640
Irrigation 510
Irrigation in the Karroo, by P. J. du Toit.. . .. 62
Irrigation in the North-West, by W. B. Gordon .. 189, 311
Irrigation, Lifting Water for, 437, 719, 728
Irrigation, On 611
Irrigation Queries .. 606, 644
Irrigation Reciprocating Pumps, Some 13
Irrigation Works at Nelspoort, Flood 828
"Izal" as a Tick Destroyer .. 746

J

Jackal-proof Fencing, Baboons and 833
Jackal-Proof Fencing, Cost of .. 157
Jackal, The Bakoor 122
Jerseys and Tuberculosis .. 9
Jointed Prickly Cactus.. 3, 116, 608
Jumper *versus* Diamond Drilling .. 276
Jumper *versus* Diamond Drills .. 602

K

Kaffir Corn, Stock Poisoned by Young 438
Karroo Flood Water, The Utilisation of 88
Karroo, Irrigation in the, by P. J. du Toit.. 62
Killing Young Foals, Mules 159, 604
Kokstad Show, The 795
Komgha, In the District of, by F. D. MacDermott 670

L

Lambs, Cooper's Dip for Tapeworm in 124
Lambs, Copperas and Salt for Bloedpens in 12
Lambs Dying 448
Lambs, Worms in 440
Lamziekte, Bone Meal and .. 273
Lamziekte, Bone Meal as a Preventive of 747
Land Measurement 721
Land, The Ploughing of .. 607
Late Cape Orange, A 266
Licences Farriers' 277
Lifting Water for Irrigation, 437, 719, 728
Lime and Sulphur as a Sheep Dip 834
Lime and Sulphur Dip, 274, 438, 609, 724
Lime and Sulphur, Still .. 725
Lime and Sulphur *versus* Imported Dip.. .. .. 441, 609
Lime in Agriculture, The Use of, by J. Lewis, M.A. 528
Lining Lucerne Lands .. 752
Lining Boreholes 613
Little's Dip and Locusts 125
Liver of Sheep, Fluke or Slak in, by D Hutcheon, M.R.C.V.S. .. 33
Locust Destruction .. 154, 600
Locust Destruction, Another Plan for 271
Locust Destruction, A Working System of 249
Locusts and Little's Dip .. 125
Locusts in the Colony 255
Locusts, The Destruction of, by C. W. Mally, M Sc. .. 106
Locust Trap, A 273
London, Cape Fruit in .. 503, 636
Loose Teeth in Cattle 601
Lynx (Red Cat) Destruction of .. 728
Lucerne and "Alfalfa" .. 157
Lucerne, Caterpillars in .. 13
Lucerne Cultivator, A New .. 103
Lucerne for Hay, Curing .. 752
Lucerne Growing by Means of Irrigation by Windmills, by A. T. Fincham 755
Lucerne Growing with Flood Water 19
Lucerne Lands, Lining .. 752
Lucerne, Saltbush, etc. .. 607
Lungs, Causes of Rupture of Air Cells of 326
Lung Worm in Sheep 666

M

Maize in Pig Feeding, Milk and .. 8
Mallet Eucalypt Bark better than Black Wattle, by D. E. Hutchins, F. R. Met. Soc. .. 781
Malmesbury, Progress at .. 5
Mammoth Pumpkin, A.. .. 831
Mangels *versus* Green Oat Silage for Milk Production 608
Manurial Experiments with Cereals, by Dr. E. A. Nobbs .. 813
Manuring Sweet Potatoes .. 278
Marketing of Fruit, Wine, Vegetables, etc., The 707
Market Rates, Current 187, 298, 400, 622, 848
Market, The Produce, 158, 313, 498, 681, 743, 851
Market, Wool and its Preparation for the 635
Mealies after Turnips 601
Measuring the Flow of Streams .. 721
Meat Supply 838
Meat Supply, Our, by P. J. du Toit 581
Meat on the Farm, Preserving .. 328
Megrims in a Cockerel 440
Merino Rams, Imported Saxony .. 102
Method in Orcharding 644
Midlands, Poison in the .. 156
Military Requirements, Horses Suitable for 827
Milk and Maize in Pig Feeding .. 8
Milk Cows, The Housing of .. 421
Milking Goats, Abnormal .. 884

Milk Production, Mangels *versus* Green Oat Silage for .. 608
Milk, The Pasteurisation of .. 321
Misunderstanding, A Slight .. 17
Moles and Bees, Ostriches .. 123
Moles, Remedies for 122
Molteno Cattle Disease.. .. 273
Moon's Influence, The 831
Mules Killing Foals .. 159, 601
Mr. Timson in Reply 610

N

Natural Enemies of the Fruit Fly, by C. P. Lounsbury .. 81
Nature, A Freak of 605
Nelspoort, Flood Irrigation Works at 828
Netting for Fruit Trees.. 2, 156
New Lucerne Cultivator, A .. 103
Non-prickly Pear, The 505
North-West, Irrigation in the, by W. B. Gordon .. 189, 311
Notes 2, 156, 316, 502, 631, 746
Notes on the Weather, 130, 287, 453, 615, 732, 841
Notices, Departmental, 133, 294, 461, 623, 739

O

Onions, "Vrot-pootjes" in .. 720
Orange, A Late Cape 266
Orange, The "Stonedale Late" .. 162
Orange Trees, Failing 514
Orcharding, Method in 644
Originating Cause of Redwater, The 830
Origin of Igneous Dykes, by Claude Warner.. 262
Osteo Porosis, by D. Hutcheon, M.R.C.V.S. .. 502, 540, 830
Ostriches, Caponising 11
Ostriches, Flies on 8
Ostriches, Moles and Bees .. 123
Ostrich Feathers, Bars in .. 437
Oudtshoorn Fruit Growers .. 634
Our Meat Supply, by P. J. du Toit 581
Outbreaks of Infectious Diseases .. 265

P

Paspalum Dilatatum 5
Pasteurisation of Milk, The .. 324
Pear, The Non-Prickly 505
Pear Trees, Failing 515
Persian Sheep, The Points of 604, 645
Pigeons, Tapeworms in.. .. 605
Pig Feeding, Milk and Maize in .. 8
Plant Import Regulations, Transvaal 250
Planting Prickly Pears to Prevent Sluiting 603
Ploughing of Land, The .. 607
Points of Persian Sheep, The 604, 645
Poisoned by Young Kaffir Corn, Stock 438
Poisoning, Alleged Caterpillar (*Intonjani*) 605
Poisoning, Post Mortem Appearance in Arsenical 511
Poisoning, Ragwort 277
Poison in the Midlands.. .. 156
Poisonous Senecio or Ragwort, The 513
Port Elizabeth Agricultural Society 691
Port Elizabeth, Prize Shorthorns at 782
Post Mortem Appearances in Arsenical Poisoning 511
Potatoes, Manuring Sweet .. 278
Poultry for Profit 123
Poultry Queries 756
Poultry, Quibell's Dip and Diphtheritic Roup in 11
Poultry, Warts on 168
Preserving Meat on the Farm .. 328
Pressure 162
Preventive of Lamziekte, Bone Meal as a 747
Preventive Vaccine for Heartwater, by D. Hutcheon, M.R.C.V.S. .. 647
Prickly Cactus, The Jointed, 3, 116, 603
Prickly Pear, Eradication of .. 17
Prickly Pear to Prevent Sluiting, Planting 603
Prize Shorthorns at Port Elizabeth 782
Produce Market, The, 153, 313, 498, 631, 743, 851
Progress at Malmesbury .. 5
Publications, Departmental, 151, 311, 496, 629, 741, 849
Pumping, Electricity for .. 122
Pumpkin, a Mammoth 834
Pumps, Some Irrigation Reciprocating 13
Purvis's Heartwater Vaccine, Dr. .. 635

Q

Queenstown Garden Trouble, A .. 163
Queries, Irrigation .. 606, 644
Queries, Poultry 756
Quibell's Dip and Diphtheritic Roup in Poultry 11

R

Ragwort Poisoning 277
Ragwort, Poisonous Senecio or .. 510
Rainfall Returns, 134, 290, 457, 619, 736, 815
Rams, Imported Saxony Merino .. 102
Ram, Typical Africander .. 598
Reciprocating Pumps, Some Irrigation 13
Redwater, The Originating Cause of 830
Remedy for Moles 122
Remedy for Snails, A 644
Reply, Mr. Timson in 610
Report of Farmers' Meetings .. 319
Re-Stocking the Heartwater Belt .. 749
Reviews 715
River Beds, Soakage from .. 323
Rivers and Sluits, Fencing for .. 163

Riversdale Show 507
Rivers, Springs alongside 14, 165
Robertson and Montagu Agricultural Society 371
Royal Agricultural Show of England, 1904 207
Ruminants, Action of the Internal Organs of 512
Ruminants, The Digestive Organs of our Domestic, by D. Hutcheon, M.R.C.V.S. .. ..
Rupture of Air Sacs, Causes of ..
Rural Cape Colony, by F. D. MacDermott, 233, 396, 670, 790
Rural Reports 126, 283, 119, 612, 729, 837
Rust in Wheat 595

S

Sale of Grafted Vines at Tokai, 503, 751
Salt, Agricultural 437
Salt and Copperas for Bloodpens in Lambs 12
Saltbush, Lucerne, etc... .. 607
Salt Bushes, The, by Dr. E. A. Nobbs 125
Salt, Dosing Cattle with Common.. 754
Sample Specifics for Farmers .. 410
Sand in Intestines of Young Ducks and Chickens 167
Saxony Merino Rams, Imported .. 102
Scab Again 723
Scab in Sheep and its Eradication, 119, 600
Scab, The Eradication of .. 836
Seedling Trees for Sale 316
Seeds for Distribution 597
Senecio or Ragwort, The Poisonous 513
Separator, Alfa-Laval Cream .. 7
Sheep Dip, Lime and Sulphur as a 834
Sheep Dips and Stockholm Tar .. 275
Sheep, Fluke in 273
Sheep, Fluke or Slak in Liver of, by D. Hutcheon, M.R.C.V.S. .. 33
Sheep, Lung Worm in 666
Sheep, Scab in .. 119, 600
Sheep, Treatment of Wireworm in.. 645
Shorthorns at Port Elizabeth, Prize, 782
Show, Barkly East 508
Show, Bathurst 506
Show, Bredasdorp 507
Show, Ceres.. 507
Show, Riversdale 507
Shows, Agricultural 156
Show Season, The .. 316, 506
Shows in 1905, Agricultural .. 261
Shows, The Country 506
Show, The Kokstad 795
Shows, The Other 316
Show, The Stellenbosch Wine .. 364
Shropshires, More 7
Slak in Liver of Sheep, Fluke, or, by D. Hutcheon, M.R C.V.S... 33
Sluiting 444
Sluiting, A Few more Words on .. 117
Sluiting and its Causes.. .. 605
Sluiting, Planting Prickly Pear to Prevent.. .. ..
Sluit Prevention .. ..
Sluits .. ..
Sluits and Dongas 718
Sluits and Sluiting 162
Sluits and the Damage they Cause . 120
Sluits, Fencing for Rivers and .. 163
Sluits, Their Evil and Prevention, by G. E. Dugmore.. .. 375
Small Fowl Yards, by F. Arnold .. 186
Snails, A Remedy for 611
Soakage from River Beds .. 323
Society, Paarl Agricultural .. 216
Soils, Ant Heap 516
Sore on Side of Head, Horse with Chronic.. 831
South Africa, Forestry in ..
South African Horse, The, by a S.A. Breeder 578
South African Made Water Drills .. 259
South African Stud Book, 4, 322, 599, 638
Southey's Scheme, Mr. W. R. .. 723
Specifics for Farmers, Sample .. 410
"Sport," A Fuchsia 606
Spray Pump, A Colonial Made .. 160
Springs Alongside Rivers 14, 165
Springs, Blasting near 125
Stellenbosch Agricultural Society, The 366
Stellenbosch Wine Show, The .. 364
Still Lime and Sulphur .. 725
Stock Farmers, Another Scourge for, 116
Stock, Destroying Ticks on .. 608
Stockholm Tar and Heartwater .. 444
Stockholm Tar and Sheep Dips .. 275
Stock Poisoned by Young Kaffir Corn 438
"Stonedale Late" Orange, The .. 162
Streams, Measuring the Flow of . 721
Streams, Weir across 720
Stud Book, South African, 4, 322, 599, 638
Stutterheim, The District of, by F. D. MacDermott 233,
Subcutaneous Emphysema, or Air under the Skin of Ducks ..
Suborbital Glands in the Duyker and other Antelopes .. 331
Sulphur Dip, Lime and .. 724
Sunflower Seeds 280
Surface *versus* Artesian Waters .. 719
Sweet Potatoes, Manuring .. 278
Syphons, Air Chambers on .. 435
Syphons on Boreholes . .. 755
Syphons, The Working of, 278, 436, 443, 602

T

Tanks, Cattle Dipping 717
Tapeworm in Lambs, Cooper's Dip for 124
Tapeworm in Pigeons 605
Tar and Heartwater, Stockholm .. 444
Tar and Sheep Dips, Stockholm .. 275

Tests of Substances for Tick Destruction, by C. P. Lounsbury 387
Tick Destroyer, "Izal" as a .. 746
Tick Destroyers, Cattle Dips as .. 320
Tick Destruction, Tests of Substance for, by C. P. Lounsbury . 387
Tick Eradication . .. 502
Ticks on Stock, Destroying .. 608
Timson in Reply, Mr. 610
Tokai, Sale of Grafted Vines at 503, 751
Tongziekte in the Horse .. 753
Tour, Horticultural Assistant's .. 640
Transvaal, Introduction of Cattle from Cape to the 640
Transvaal Plant Import Regulations 250
Trap, A Locust 272
Traumatic Pericarditis, caused by a piece of wire 161
Treatment of Wireworm in Sheep.. 645
Trees for Sale, Seedling .. 316
Tuberculosis, Jerseys and .. 9
Turnips, Mealies after 601
Typical Africander Ram .. 598

U

Underground Water Supply, by Claude Warner 262
United Vine and Fruit Growers' Congress 822
Useful Imperialism 746
Use of Lime in Agriculture, The, by J. Lewis, M.A. 528

Vaccine, Dr. Purvis's Heartwater .. 635
Vaccine for Heartwater, Preventive, by D. Hutcheon, M.R.C V.S. .. 617
Value of Cactus on Dry Lands, The 663
Vegetables, &c, The Marketing of Fruit, Wine 707
Vermin on Fowls 606
Vesicular Stomatitis or Tongziekte in the Horse, Aphtha.. .. 753
" Victor Don " 329
Victoria, Wheat Experiments in .. 750
Vine and Fruit Growers' Congress, United 822
Vines at Tokai, Sale of Grafted 503 751
Voluntary and Compulsory Dipping 7
" Vrot-pootjes " in Onions .. 720

W

Warts on Poultry 168
Water Drills, South African Made.. 259
Water for Irrigation, Lifting, 437, 719, 728
Waters, Surface *versus* Artesian .. 719
Weather Forecast, by D E Hutchins, F.R. Met. Soc. 105
Weather Notes, by C. M. Stewart, 130, 287, 453, 615, 732, 841
Weirs across Streams 720
Western Grain Harvest, The .. 11
Western Province Agricultural Society, The 1905 Show .. 554
Western Province Horticultural Board 56
Wheat Experiments in Victoria .. 750
Wheat, Rust in 595
Wild Animals in Captivity .. 279
Windmills, Lucerne Growing by means of Irrigation, by A T. Fincham 775
Wine Show, The Stellenbosch .. 364
Wine, Vegetables, etc , The Marketing of Fruit 707
Wire Fences, Hand Weaving .. 509
Wireworm in Sheep, Treatment of.. 645
Wool and its preparation for the Market 635
Worcester Agricultural Society .. 381
Working of Syphons, The, 436, 413, 602
Worms in Lambs 110

List of Illustrations in the Text.

Some Irrigation Reciprocating Pumps 15
A Forest Stream, Knysna .. 18
Road through Knysna Forest, Millwood 27
Chromo. of section of Liver shewing matured Fluke .. ..f. 32
Adult Fluke (two views) .. 34
Egg of Liver Fluke 35
Egg of Liver Fluke 36
Embryo of Liver Fluke (two views) 36
Embryo of Liver Fluke changing into Sporocyst 37
Sporocyst 37
Sporocyst dividing into two .. 37
A full-grown Sporocyst .. 38
A Young Redia 38
A full-grown Redia 38
A free *Cercaria* 39
A *Cercaria* in the act of forming its Cyst 39
Three Cysts of the Liver Fluke on blade of grass 39
The Snail, *Limnæus truncatulus* .. 41
Plan of Farm "Varkenskop" ..f. 88
No. 1 Weir, showing Sluice Gate .. 89
No. 2 Weir, showing River Dammed 91
No. 3 Weir, for spreading floods over low-lying lands .. 93
Stable and Farm Buildings .. 95
Devon Cow "Cowslip" .. 97
Young Devon Bull "Pound Lord Chancellor" 99
Views of the Weirs when the Floods are out 101
A New Lucerne Cultivator .. 103
A Colonial-made Spray Pump .. 160
Fencing for Rivers and Sluits .. 163
An Engineer's Caisson .. 166
Indigenous Forest, Knysna f. 173
Eucalyptus saligna and *E. diversicolor* at Tokai Sphinx Rock f. 174
Sketch of Islands in the Orange River 197
Sketch of Saai Dams and Garden at Uitspan Kop 204
Hunter Gelding, Winner, Royal Agricultural Show.. .. 206
Hackney Stallion, Winner, Royal Agricultural Show.. .. 208
Clydesdale Stallion, Winner, Royal Agricultural Show 209
Shire Stallion, Winner, Royal Agricultural Show 210
Shorthorn Bull "Ronald," Winner, Royal Agricultural Show .. 211
Hereford Bull, Winner, Royal Agricultural Show 212
Devon Bull, Winner, Royal Agricultural Show 213
Ayrshire Cow, Winner, Royal Agricultural Show 214
Jersey Bull, Winner, Royal Agricultural Show 215
Shropshire Ram Lambs, Winners, Royal Agricultural Show .. 215
Shropshire Shearling Ewes, Winners, Royal Agricultural Show .. 216
Shropshire Shearling Ram, Winner, Royal Agricultural Show .. 217
Large White Boar. Winner, Royal Agricultural Show.. .. 218
Berkshire Boar, Winner, Royal Agricultural Show 219
"Bush Side" Amobele .. 231
Mr. G. W. Turpin's Orchard on Waterford Estate 237
Some of Mr. Turpin's Shorthorns .. 238
Mr. Turpin's Imported Red Lincoln Shorthorn Bull on the Veld .. 238
The Shearing Shed, Waterford Estate 241
Interior of Shearing Shed, Waterford Estate 242
The Residence of the Irvine family, Waterford Estate 243
View of the Kubusie Valley at Waterford 244
Messrs. Cunningham & Gearing's South African made Percussion Drill 260
Samples of "Stonedale Late" Oranges 267
Diagrams of Pits for Locust Destruction 270
Fountain on Mr. W. R. Southey's Farm 323
"Victor Don" 330
Indigenous Forest, Knysna .. 338
Homtini Forest, Knysna .. 341
Zak River, Sketch Plan of Brand Vlei Irrigation Works .. 347
Sketch of Irrigation Works at Blokzyn Kolk 350
Views of Donga on Indwe Commonage 376
Views of Donga on Indwe Commonage 377
Proposed Dam at Doorn River .. 379
Cloverdale, the Homestead of Col. Warren, M.L.A. 397
Ripplemead, Kubusie, the Homestead of Mr. R. Poll Edmonds.. 398
Imported Welsh Bull in the Veld at Ripplemead 399

Group of Young Welsh Cattle at Ripplemead 401
Imported Welsh Heifer " Plas Pet " at Ripplemead 402
Group of Stud Ewes at Ripplemead 403
Young Ram " Enterprise," property of Mr. R. Pell Edmonds .. 405
Views of a Locust Trap .. 412
Locust Trap showing sections of Screen 413
Atriplex Nummularia, Lindl. Round-leaved Salt Bush .. 427
Atriplex Halimoides, Lindl. " Halimus-like Salt Bush " .. 428
Atriplex Semibaccata, R. Br. " Half berried Salt Bush " .. 429
Atriplex Holocarpa, F v. M. " All-fruited Salt Bush " .. 430
Atriplex Angulata, Benth. " Angular-fruited Salt Bush " .. 431
Hand-woven Vermin-proof Wire Fence 509, 510
Sneezewood Tree in the Perie Forest 521
Doutsah Forest, Amatolas, showing Upright Yellowwood .. 522
Chromos. (4) showing effects of Osteo porosis .. f. 550
Osteo-porosis .. 551-553
Western Province Agricultural Show, 1905 552, 557, 559, 561
The Champion Imported Stallion .. 563
Champion S.A. Bred Stallion .. 564
Champion Heavy Breed Bull .. 565
Champion Light Breed Bull .. 566
Champion S.A. Heavy Breed Bull .. 567
Champion S A. Heavy Breed Cow .. 568
Champion S.A. Light Breed Cow .. 569
Champion Fine-woolled Merino Ram 570
Champion Fine-woolled Ewe .. 571
Champion Robust-woolled Merino Ram 573
Champion Robust-woolled Ewe .. 576
Typical Afrikander Ram, side and back views 598
Old Homestead, Prospect Farm .. 671
View of Orchards at Prospect Farm 672
Grove of Portugal Lemons at Prospect Farm 673
Young Citrus Groves at Prospect Farm 675
Young Naartje Tree at Prospect Farm 677
Ostrich Feathers at the Grahamstown Show 687
First Prize Fruit Exhibit at the Grahamstown Show .. 688
Mr. F. W. Southey's Tasmanian Prize Sheep .. . 691
Ostrich Feathers at Port Elizabeth Show 695
Wool and Mohair Exhibits at Port Elizabeth Show 696
Champion Ram (Fine-woolled), Port Elizabeth Show 699
Champion Ram (Robust-woolled), Port Elizabeth Show .. 699
Champion Ewe (Robust-woolled), Port Elizabeth Show .. 700
Champion Angora Ram .. 700
Angora Ram, winner of the registered prize at the Port Elizabeth Show 703
6-Tooth Angora Ewe, winner of the registered prize at the Port Elizabeth Show 703
Section of Cattle Dipping Tank .. 717
Lucerne Fields Irrigated by Windmills 773
Rearing Pens for Ostrich Chicks and Pigs 774
" Pompom," First Prize Imported Shorthorn Bull at Port Elizabeth Show 782
" Gerald," First Prize Colonial-bred Shorthorn Bull at Port Elizabeth Show 783
Family of Shorthorns 783
The Orchards at " Sunnyside " 791, 792

THE

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OF THE CAPE OF GOOD HOPE.

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CONTENTS.

PAGE.

NOTES— 1—10

Netting for Fruit Trees—The Fruit Fly—Forestry in South Africa—The Utilisation of Flood Waters—Sluits—Jointed Prickly Cactus—South African Stud Book—*Paspalum Dilatatum* still leads—Progress at Malmesbury—Shropshires—The Alfa-Laval Cream Separator—Voluntary and Compulsory Dipping—Flies on Ostriches—Milk and Maize in Pig Feeding—Jerseys and Tuberculosis—An Ingenious Hand Milking Machine.

FARM AND VELD—(*Illustrated*)— 11—17

The Western Grain Harvest—Caponising Ostriches—Quibell's Dip and Diphtheritic Roup in Poultry—Copperas and Salt for Bloedpens in Lambs—Caterpillars in Lucerne—Some Irrigation Reciprocating Pumps—Springs alongside Rivers—The Eradication of Prickly Pear—"On Gates," a slight misunderstanding

EXTRA-TROPICAL FORESTRY, by D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town ... ... 18—32
AGRICULTURAL SHOWS IN 1905 32
FLUKE OR SLAK IN THE LIVER OF SHEEP, by the Chief Veterinary Surgeon, D. Hutcheon, M.R.C.V.S. ... ... 33—48
ANALYSIS OF FERTILISER 18
GROWING LUCERNE WITH FLOOD WATER ... ... 49—55
WESTERN PROVINCE HORTICULTURAL BOARD ... ... 56—62
IRRIGATION IN THE KARROO, by P. J. du Toit ... ... 62—68
EASTERN PROVINCE FRUIT GROWERS' CONGRESS ... ... 69—83
NATURAL ENEMIES OF THE FRUIT FLY, by C. P. Lounsbury, Govt. Entomologist ... 84—87
THE UTILISATION OF KARROO FLOOD WATER (*Illustrated*) ... ... 88—101
IMPORTED SAXONY MERINO RAMS 102
A NEW LUCERNE CULTIVATOR (*Illustrated*) ... ... 103—104
WEATHER FORECAST ... ... 105—115
CORRESPONDENCE— 116—125

The Cape Muscat—Another Scourge for Stock Farmers: the Jointed Prickly Cactus—A few More Words on Sluiting—Scab in Sheep and its Eradication—Sluits and the Damage they cause—Citrus Culture Commission—Electricity for Pumping—Remedy for Moles—The Bakoor Jackal—Fowls and External Parasites—Ostriches, Moles and Bees—Poultry for Profit—Cooper's Dip for Tapeworm in Lambs—Little's Dip and Locusts—Blasting near Springs—Croft's Tincture, a Challenge.

RURAL REPORTS ... ... 126—129
NOTES ON THE WEATHER OF NOVEMBER, 1904 ... ... 130—133
RAINFALL RETURNS FOR NOVEMBER, 1904 ... ... 134—136
CURRENT MARKET RATES 137
DEPARTMENTAL NOTICES ... ... 138—150
DEPARTMENTAL PUBLICATIONS ... ... 151—152
THE PRODUCE MARKET ... ... 153—154
INDEX TO ADVERTISERS ... ... iix—ix

3

NOTES.

Netting for Fruit Trees.

The Secretary of the Western Province Horticultural Board asks in another part of this issue for applications for netting for fruit trees, to be sent to him not later than April 1st.

The Fruit Fly.

All fruit-growers will wish Messrs. Lounsbury and Fuller a successful issue to the venture they are embarking on as explained in an article by the former in the present issue. Of all the pests that worry the fruit-grower in this country none seem so far beyond control as the fruit-fly. This was fully demonstrated by Mr. C. W. Mally in his exhaustive article in the last issue. And when there is even a remote possibility of securing natural enemies to keep the plague in check, the whole community must wish well to the men who are setting out on the quest. It is a serious and a laborious task that Messrs. Lounsbury and Fuller are undertaking; but if they succeed they will place the whole of this country under a deep debt of obligation to them. It is to be hoped that no one will expect too much of the expedition, for as Mr. Lounsbury says, there are many obstacles to complete success, and there is even the probability of failure; but the effort is well worth making. We strongly recommend all interested to read Mr. Lounsbury's article on the subject in this issue, and wish the voyagers health to carry on this work and a successful issue at the finish, in which we feel sure all our readers most heartily join.

Forestry in South Africa.

In this issue we begin the publication of a work on Forestry in South Africa, under the title of "Extra-Tropical Forestry," by Mr. D. E. Hutchins, Conservator of Forests, which, we believe, will prove of great value as an earnest and thoughtful contribution to the literature of that fascinating subject. Comprehensive works dealing with the larger cultural questions of this country are sadly lacking, and this as a beginning should set up a spirit of emulation, which should bring good results. The whole work will appear month by month with copious illustrations, as a serial in the *Agricultural Journal*, and when completed will be published in book form. So the readers of the *Agricultural Journal* will have the advantage of a complete work on the whole subject of "Extra-Tropical Forestry" free of charge, if they only take the trouble to file their copies as they receive them. We should like to be able to deal with other leading cultural subjects in the same broad and comprehensive manner, and hope to attain our ideals at a later stage. Meanwhile we commend the efforts of Mr. Hutchins to our readers.

The Utilisation of Flood Waters.

So widespread an interest has been displayed in the work carried out by Mr. W. R. Southey on his farm Varkenskop, Schoombie, for the utilisation of flood waters that we anticipate an appreciative reception for the further particulars with plans and illustrations we are enabled to give in this issue. Mr. Southey is over modest in the paper he read before the Cradock Farmers' Association and while saying sufficient to give some idea of the valuable works he has carried out, but whets the appetite for more. As an object lesson of what can be done by patience and increasing toil and watchfulness, Varkenskop stands as an example to the whole country. It would be absurd to say that what has been done there might be done everywhere, because the conditions are very favourable: but this success should spur others to emulation. Mr. Southey worked out his plans and schemes for himself. He was content to labour and profit by his mistakes, accepting no set back as entire discouragement. This is the conquering spirit which triumphs over all obstacles and we need more of it in this colony. Men must think and work for themselves, noting the local conditions and adapting them to their needs as the occasions arise.

Sluits.

We welcome the contributions which are published in the correspondence this month on the subject of "Sluits." Though not agreeing with everything that appears in these letters we were exceedingly glad to receive them as evidence of the serious interest which our farmers are beginning to evince in one of the vital questions of the country. If the scanty rainfall of our dry districts is to rush to the sea and carry our soil with it the end can be seen by the least thoughtful. Drought, locusts, scab and all the other pests which afflict us sink into insignificance beside the appalling prospect of watching the major portion of the country gradually becoming an arid desert. Too much attention cannot be given to this subject and everyone should give some thought to it, if only in the vein of our correspondent "A.S.J." who takes an admittedly extreme view. That remedies can be applied is certain, but they must be brought to bear gradually. It would take probably a century of carefully planned work to reach the pitch sketched by "A.S.J." But even that is not impossible.

Jointed Prickly Cactus.

The scourge of "Jointed Cactus," mentioned by Mr. O. E. G. Evans in the correspondence pages this month has been seriously discussed on more than one occasion in the *Agricultural Journal*. Enquiries have been set afoot with the result that there seems to be but one reliable and effective remedy and that is one involving expense and co-operation. To get rid of this pest it must be stubbed out, gathered into heaps and sprayed with scrub exterminator (Arsenite of soda). It is objected that this method is not only costly but liable to fall short of complete success because the wretched thing separates at the joints so easily and the small sections that fall off take root and spread as rapidly. But the danger is so real, as Mr. Evans shews, that even though the cost may appear large and the labour continuous for a time, it will be worth all the trouble and expense if it can be checked. This is essentially a case for co-operation for several districts are affected and little or no advantage can be gained by individual effort, the evil must be tackled on the grand scale if it has to be stopped, and we should like to hear what others have to say on this aspect of the question with suggestions.

South African Stud Book.

Those who are interested in South African stock breeding (writes Mr. C. G. Lee of Klipplaat) will have observed, that there is an increasing number of farmers who aim at breeding the most profitable class of pure-bred stock. The desire is growing, amongst stock owners, to become possessed of the best and most suited animals. This forward movement is, however, seriously checked and progress is heavily handicapped, because this country possesses comparatively speaking, a very limited number of pure stock with a reliable guarantee in the shape of a trustworthy pedigree, and then there is the great drawback, caused by the wide area over which the limited number of pedigree stock are spread about in a country like ours, with its great distances, making it exceedingly difficult for one to know where to find the few pure stock that do exist.

Of course some few are fortunate enough to have a next door neighbour, breeding pure stock and whose flocks and herds are a matter of one's frequent inspection, and so fresh blood can be obtained with a certain amount of ease and confidence. In such cases much of the difficulty is removed. Then again there are breeders whose stock are so well-known throughout the country, that to secure stock from them needs no more than posting an order, with perfect confidence in getting the animal as represented. But in the great majority of cases the breeder and the would-be-buyer are widely separated in many respects. This gulf between the breeder and buyer will be bridged by the South African Stud Book, which will act as the medium whereby the breeder of good stock will be introduced to the stock owners of South Africa and of the world. In every corner of the country, any stock owner would be able to know, if he wished, exactly where he could procure pedigree blood to improve his flocks and herds.

The Stud Book will at the same time encourage the importing of good stock, because a breeder could afford to give a higher figure for a good animal, if its progeny could be registered in such an accredited and widely recognised Stud Book as the one it is proposed to form. Not that the writer would wish to lay too much stress on building up our stock breeding scheme solely on imported blood—far from it—being convinced that the Stud Book scheme will result in South African breeders laying the foundation on Colonial bred stock as time goes on. Nevertheless all will agree, that we must have imported animals and it is part of the scheme to hold out every inducement to importers, but guarding against impure and bad blood from abroad.

These things have long been recognised by South African breeders, and the Stud Book move will materially assist in working out what is recognised to be the safest lines for stock breeding. Those who feel any interest in the Stud Book Association, can on application, receive a copy of the rules, from the Editor *Agricultvral Journal*, Agricultural Department, Cape Town or from the Hon. Secretary, Mr. H. Abrahamson, Kat Kop, P.O. Fish River Station. By announcement in this issue it will be seen that the Association is opening its books for registration shortly and is now open to accept applications for membership.

Paspalum Dilatatum still Leads.

We have had a good deal to say at one time and another about the merits of that excellent fodder grass, *Paspalum dilatatum* (Golden Crown Grass), and it is interesting to learn that though other varieties have been brought forward none have so far given greater satisfaction. A year or two ago the Hawkesbury Agricultural College issued returns, from which it appeared that *Paspalum stoloniferum* had given a higher yield of forage than *P. dilatatum*, and the Superintendent of Tokai (Mr. H. M. Orpen), who is always anxious to introduce new forage plants, applied through this Department to the Department of Agriculture, New South Wales, for some *stoloniferum* seed. The answer received was that it was not obtainable, as this grass seemed to have gone out of cultivation as being unsuited to the general climatic conditions of that country, requiring, as it does, plenty of moisture, and dying off with about three degrees of frost. It was also stated that with heat and moisture the said grass thrives very well, but even with those conditions *Paspalum dilatatum* is considered to be superior in every respect.

Progress at Malmesbury.

A new Agricultural Society has been formed at Malmesbury and recently held a meeting for the purpose of discussing the advisability of holding a Show. There was an attendance of over eighty farmers and others, and much interest was shown in the well-being of the movement.

No district ought to be better able to hold a good annual show, as it possesses within its own boundaries not only single breeders and farmers of note, but whole communities, whose particular class of farming has given them a wide reputation. At a Malmesbury show one will look for strong classes, not merely the one or two entries so often seen elsewhere—literally "one-horse shows."

Friesland-Ayrshire and the cross-bred type, typical of Saldanha Bay, should give rise to keen competition amongst cattle, while some of the most noted horse-breeding farms of the Western Province lie within the Malmesbury sphere of influence, and in few districts are farmers more justifiably proud of their cart horses.

The wine and fruit farms of Paardenberg and Riebeek Kasteel should send their quota of exhibits, and certainly the exhibition of cereals ought to be the best in the Colony. Agricultural implements of all sorts should be a very strong feature. Indeed Malmesbury may be expected to provide one of the best shows in the country.

A prime essential for success is the hearty co-operation of all concerned and it is sincerely to be hoped that all portions of the district will unite to make the show a thoroughly representative one. Only by this means can it serve its most useful purpose, that of attracting buyers from all parts who may gauge in the course of one day the productive capacity of the district and establish business relations which shall redound to the advantage of the whole community. This aspect of our agricultural shows is apt to suffer and give way to the pic-nic element, but the Malmesbury meeting was eminently a business one and it may be expected that the show when it is held will partake of the same nature.

Piquetberg district as yet boasts no agricultural society and it might be well if Malmesbury would throw all classes open to exhibits from both districts, charging its own members of course a lower entry fee and in this way benefit a larger area and at the same time add to its success and gate money.

Agricultural Co-operation is much in evidence these days and apart from the more formal methods of banks and supply associations it must not be forgotten that the holding of shows and fairs is an eminently practical manifestation of the same principle. Quite recently an early market for agricultural produce has been opened at Malmesbury, and in Paarl a similar proposal is under discussion. This form of "help-makaar" is in every way desirable. It benefits both the urban consumer and the farmer who finds a ready means of disposing of those minor forms of produce of which he has insufficient quantity for sale on a large scale. Sold on the early market they not only bring a welcome profit but that very real convenience, ready money.

More Shropshires.

A few weeks back four more magnificent Shropshire rams were landed at Port Elizabeth, consigned to Messrs. William Cooper and Nephews, proprietors of Cooper's Dip. These animals are from the famous Cooper flock, and were much admired by all who saw them. Two of them will have their future homes in the O.R.C., and two in the Middelburg (Cape) district where, it is proposed, they will be mated with Merino ewes, for the purpose of raising early cross-bred fat lambs for the butcher. The distinct advantage of the Shropshire-Merino cross is not only early maturity and ample carcase for slaughter purposes, but a good marketable fleece as well.

The Alfa-Laval Cream Separator.

The Alfa-Laval Cream Separator has again scored high honours. The agents, Messrs. Howard, Farrar, Robinson, & Co., of Port Elizabeth, East London and Durban, recently received cable information to the effect that the jury deputed to adjudicate on the cream separator exhibits at the St. Louis Exposition have awarded the grand prize to the Alfa-Laval machines. This is all the more gratifying because this was the only grand prize awarded to any cream separator at the Exhibilion.

Voluntary and Compulsory Dipping.

At the opening of the "Ansley" Tank at Roundhill, in the Bathurst District, Mr. W. E. Masters, the President of the local Farmers' Association, showed where voluntary dipping might end, and compulsion become necessary, by saying that the tendency of persistent dipping, while it would eradicate the tick, would be at the same time to eradicate the disease and the existing immunity derived from the presence of the tick itself, and that it would be unjust to those who dipped, and by thus dipping created a red-water-free veld, if one obstinate individual who refused to dip should have it in his power to undo all the good they had done, and re-introduce all the terrors of red-water, which would be attended with all the losses sustained at its first attack, by having the right to go and do as he pleased. He then illustrated ox-ploughing *versus* steam-ploughing to show the value of cattle, as it had been proved to him that no matter how broad the wheels of the traction engine were that hauled the plough behind it, it left such a hard rolled track, and made cultivation so ineffective that the ox not only did better work, but taking the expenses of the skilled mechanic, which went on whether rain fell or not, the ox could do it cheaper. So that if we can buy trek oxen at from £7 to £9 each, we need not fear that our small lands and our ox-ploughing will ever be out-classed by traction engines that draw ploughs, &c., behind them.

Flies on Ostriches.

Messrs. Lilienfeld and Wright, of Hopetown district have written complaining of a plague of flies on their Ostriches. They had just completed the plucking and found the whole of the birds some 400 in number, covered with flies—some specimens of which were forwarded. The birds were much impoverished through the annoyance caused by these insects and the writer asked for a remedy.

The specimens sent were identified as the Ostrich fly (*Hippobosca struthionis*) and as Messrs. Lilienfield and Wright had found that they succumbed to insect powder they were advised to continue that treatment. This pest is not altogether new in this country and we would like some of our Midland readers to give the methods adopted, by them to get rid of it. Many ostrich breeders are strong believers in providing their birds with dust baths.

Milk and Maize in Pig-feeding.

For seven years the Vermont Experiment Station has conducted experiments with the feeding of pigs on both sweet and sour skim-milk, and in varying combination with other foods. The sour milk has proved practically as good as the sweet for fattening purposes, and where there has seemed to be any difference it was in favour of the sour milk. The value of the skim-milk during this period varied between 7½d. and 1s. 5d., and averaged 1s. 0½d. per 100lbs. In one experiment buttermilk was found to have a feeding value of 1s. per 100, and whey of 5½d. per 100. The best proportions of skim-milk and maize meal to feed together have been studied in a number of experiments. The use of 2ozs. of maize meal to each quart of milk, yielded pork at the least cost of food, but a more rapid gain was made when a greater proportion of maize meal was fed. In finishing off pigs, more rapid and cheaper gains were made when 12 quarts of skim-milk were fed in addition to all the maize meal the pigs would eat than when but six quarts were thus fed. The feeding of bulky or water foods were found to conduce to a larger growth of stomach and intestines, and hence greater shrinkage in dressing. Maize meal in one experiment produced 11 per cent. better gains than wheat middlings with young growing pigs, and 23 per cent. better than rice meal with pigs weighing about 140lbs. The results of two experiments show more rapid gains on ground than on whole corn, the difference being about 10 per cent. The extra cost of hauling and grinding the grain, it is thought, would probably counterbalance this gain. Wetting maize meal resulted in more profitable gains than feeding it dry. The fertilising value of the food fed in the various experiments has averaged 56 per cent. of its market value. In nearly all the experiments profitable gains ceased to be made after the pigs had attained a weight of 180lbs.

Jerseys and Tuberculosis.

It is a remarkable fact that tuberculosis is said to be unknown among the cattle of the Channel Islands. Why cattle in those islands should be immune (says the *Irish Homestead*) from that dread disease, and those fed on the shores of the British Channel on the mainland, only a few leagues distant, should be subject to the disease, is a matter that our veterinary authorities should investigate. In Great Britain and other countries tuberculin is recommended with a view to stamping out the disease, but there is no tuberculin used in the Island of Jersey, nor any need for it. The theories we have heard urged as to the immunity from the disease in the Channel Islands are that the cattle are kept very much in the open, and that the climate is sunshiny, but the difference of the sunshine between the Channel Islands and the south coast of England cannot be considerable. Perhaps it is due to the open-air life of the animals, or perhaps it may be owing to the circumstance that no live cattle have been permitted to land on the islands for upwards of a century, thus preventing contagion. On the other hand, the cattle, on account of no fresh blood being introduced, should be very much inbred, a matter which ought to have a weakening influence on their constitutions. We should like to know if Jerseys bred in England or Scotland are healthier than the other breeds. The Hereford men claim that their cattle suffer very little from the disease, but if so, why so? These are questions not difficult of solution, and are such as the Government should investigate, and let breeders know the real cause of the immunity of Jersey cattle from tuberculosis, with a view to learn if the practice pursued in the Channel Islands may not be extended to all parts of the empire. This is one of the ways in which a department of Agriculture could assist cattle-breeders.

An Ingenious Hand-Milking Machine.

One of the ingenious new machines brought out to supplant manual labour, exhibited at the English Dairy Show, was a hand-milking machine, the invention of Mr. C. S. Padfield, Hemington, Bath. The machine is put under the cow on the right hand side, the stand and handles being beside the cow. In adjusting to the required height, plates come up in the middle of the udder and the teats drop outside of them. By turning the handle the rollers come round, draw the teats against the compression plates, and the downward rolling pressure of the rollers, in conjunction with the resistance offered by the plates, flattens the teats and causes the milk to flow into the pail provided. The compression plates are provided with safety springs and covered with rubber, and the rollers are rubber-covered. The space between the rollers and the plates] can be adjusted for large or small teats, and the other parts can be instantly adjusted to fit the cow. The machine milks all four teats of the cow at once, weight only 28lb. complete with stand and pail; pail holds three gallons. Machine requires no fixing, can be easily washed in a tub of water; milks the cow dry; the milk is clean, as the hands need not touch the teats, and there are no pipes for the milk to run into and get tainted. It does not suck or rub the teats. The working parts are made of aluminium, combining lightness with strength and durability. The price complete, packed and delivered, is £7 10s.

Cape Stud Breeders' Association.

THIS ASSOCIATION is open to accept applications for Membership, and as soon as the preliminaries are finally arranged will begin to register Members' Stock. For Rules, or any information, apply to

C. G. LEE,	or	**HAROLD ABRAHAMSON,**
President,		**Hon. Secretary,**
P.O., Klipplaat Station.		**Fish River Station.**

January 2nd, 1905.

FARM AND VELD.

The Western Grain Harvest.

The harvest in the Malmesbury district has in spite of the anomalous season turned out very well indeed. The oathay crops are plentiful all over, especially towards the coast.

Wheat is good but rust has been common in it. Rietti continues to be immune and is gaining in popularity as the only variety which may be depended upon to withstand the disease. Satisfactory as it is to have one kind that is reliable, yet it is unpleasant to think of what would happen were it suddenly to give way as did the old Cape oat. It is high time that by cross-fertilisation, or otherwise, other rust-resistant varieties were obtained; more especially would these be welcome if with resistant character they combined better grinding properties. Rietti, in spite of not being the best of flour wheats, finds a ready market with the miller.

Caponising Ostriches.

Some weeks back a correspondent, (Mr. P. G. Marais, of Nieuwjaarsfontein, De Put Siding) wrote asking for information with regard to the advantages of caponising ostriches. Information on this subject is not easily obtainable, but from what we have been able to gather through the Veterinary Staff and by enquiries among experienced breeders, it seems doubtful whether it would be worth the trouble. The operation can be performed in much the same way as described in the recent notes by Veterinary Surgeon Elley on the caponising of cockerels—of course making allowance for the bulk and size of the ostrich as compared with the domestic fowl. It has been tried by several experienced ostrich farmers but the results were not encouraging. The reason is that the ostrich is cultivated for his plumage, and emasculation, if anything, detracts from the quality of the finer feathers. The operation has the effect of taming bad tempered birds of a wild disposition but has no other advantage so far as we can learn. If the ostrich were cultivated for his flesh, like the domestic fowl, there might be the same advantage in caponising in the one case as in the other.

Quibell's Dip and Diphtheritic Roup in Poultry.

Mr. G. van Niekerk of Bethesda Road, writes: In the November issue of the *Agricultural Journal* I see a disease in poultry called Diphtheritic Roup of Poultry. Let anybody troubled with that disease in poultry try and give every sick fowl a teaspoonful of pure Quibell's Dip every third day till cured. We have been very successful with this remedy and have cured very severe cases.

On this the Chief Veterinary Surgeon offers the following comments:—As I entertained considerable doubt whether a fowl could with safety be made to swallow a teaspoonful of Quibell's Sheep Dip pure, as recommended by Mr. Van Niekerk, I asked Dr Robertson to administer this dose to a healthy full-sized hen. I watched the operation; a full teaspoonful of the pure dip was drawn into a syringe, and an india-rubber tube was attached to the nozzle, the free end of the tube was carefully passed down the hen's throat, and the liquid gently forced down the œsophagus into the crop, so as to avoid any of it passing into tho trachea. It was manifest that the dose caused extreme pain and discomfort. The fowl immediately crouched down, opened and closed her beak in a gasping manner. and tears flowed freely from her eyes. These symptoms were exactly similar to those exhibited by an individual who at a public dinner has accidentally swallowed a boiling hot potato and tries to endure the sensation in silent agony. From the symptoms, I felt convinced that the dose would kill her, but I was agreeably surprised to find her alive the following morning, she was however, still sore and uncomfortable, and suffering from slight diarrhœa, the fluid fæces containing a large proportion of mucus.

The dose is much too severe, and I am surprised that Mr. Van Niekerk was able to administer it safely in the ordinary way by pouring it out of a spoon. I am certain that if we had attempted to give that dose in that manner that we would have choked the bird, or produced acute bronchitis. I can quite believe that the dose would be effective in destroying the diphtheritic membranes which make their appearance in the mouth in Roup, but I think that dressing the parts carefully with Quibell's Dip, or similar fluid would be equally effective and much less dangerous. I am really unable to recommend Mr. Van Niekerk's dose, it should be diluted with at least three times its bulk of water.

Copperas and Salt for Bloedpens in Lambs.

Mr. G. van Niekerk, of Bethesda Road, writes:—My ewes have started lambing again, and lambs have again been dying of Bloedpens. So I caught out all the ewes that were in lamb, and dosed them with Copperas and salt "one part of Copperas to ten of salt" and gave them each a teaspoonful; since I have dosed them I haven't lost any lambs. I would like to know if this could have the effect?

This was also referred to the Chief Veterinary Surgeon, (Mr. D. Hutcheon, M.R.C.V.S.,) who offers the following comment:—Facts are stubborn things and if Mr. van Niekerk has succeeded, even temporarily, in arresting the further spread of Bloedpens amongst his lambs by administering to the ewes a teaspoonful of a mixture of one part of sulphate of iron—(Copperas)—to ten parts of common salt to the pregnant ewes sometime before lambing the experiment is worth repeating. I hope that he will report again on this subject, it would be interesting to know whether the dose was administered only to ewes—which were manifestly close to lambing. I cannot give any satisfactory explanation how a single dose of the mixture to the ewe should act as a preventive of this disease to the lamb. But there are many facts in empirical medicine, as well as in other branches of study, which we are unable to give a satisfactory explanation of.

Caterpillars in Lucerne.

Some weeks back Mr. Will. Allan, of Gateshead, Oudtshoorn' wrote complaining of a plague of caterpillars in his lucerne. He said: "I think it must be the same insect that they have in America, called the Army Worm or Alfalfa Worm. Could you not publish in your valuable journal some of the methods used in America to combat this scourge? I believe they use the disc harrow on their lands to destroy the eggs by exposing them to the elements and birds. Perhaps some reader may be able to give us a little information on the subject." As this was not very definite, we wrote and asked Mr. Allan to forward specimens, which he did. These were referred to the Government Entomologist, who reported on them as under:—

"It is not clear what the chief pest is in this case. The ladybirds are *Epilachna similis,* a species of wide spread occurrence in the Colony and well known for its injuries to mealies, oats and other grain crops. I have never observed it feeding on lucerne. There are ten caterpillars in the box. Three of these are the Heliothis caterpillar, *Heliothis armiger,* a species found in most countries and one which this year has been very abundant and injurious both east and west in the Colony. It eats almost any kind of plant including lucerne. The flower and fruit is preferred to the foliage. It is this pest that eats into mealie cobs, pea pods and early tomatoes. Vine and fruit growers know it as "*the* risper." The fourth caterpillar is probably *Colias electra.* The specimen was decayed when it arrived. This species is very partial to lucerne. The adult is a yellow butterfly. The caterpillar is green with a white stripe along each side. The eggs for both kinds of caterpillars are laid, generally one at a time, on the leaves of the plant. We have found it possible to kill the caterpillars when on lucerne by spraying with arsenical poisons, but the usual remedy is to mow off the tops and feed them as soon as it is seen that caterpillars are present in great numbers. Sometimes a disease appears and kills off nearly all the caterpillars in a few days' time."

Some Irrigation Reciprocating Pumps.

"Apex" writes:—The simplest of these are "suction" pumps (fig. 1.); they cannot economically raise water above the pump body, and consequently are not used for lifts of over 28 feet, say 26 feet maximum advisable limit at sea level. Being "single action" (raising water on the up stroke and doing the return stroke unloaded), they are worked satisfactorily by lightly-built wind mills, and give more water than any other pumps with the same size of wind wheel.

"Force pumps" (fig. 2.), made either single, double or treble acting are necessary for greater heights; these have a "delivery valve" (*a* through which the water is forced after leaving the pump cylinder. This valve must have a door over it, through which it can easily be got at. Pumps are sometimes made on the syphon principle, in which water from a suction pipe is admitted at (*e*) and falls into a well (*f*), from which it has no escape until raised by the bucket.

Non syphon pumps (fig. 5.) should have a small branch pipe with screw tap on it, leading from delivery pipe (*d*) into cylinder. Both arrangements save refilling with water by hand, which otherwise would be necessary from time to time, for pumps, when packings and valves wear, lose their water while standing.

Double action piston pumps with hemp packing are generally inadvisable, owing to the practice required before the packing can be well put on, the want of means to take up any slight wear, the difficulty of getting at them to repack, and the short time such packings keep tight when there is much sand.

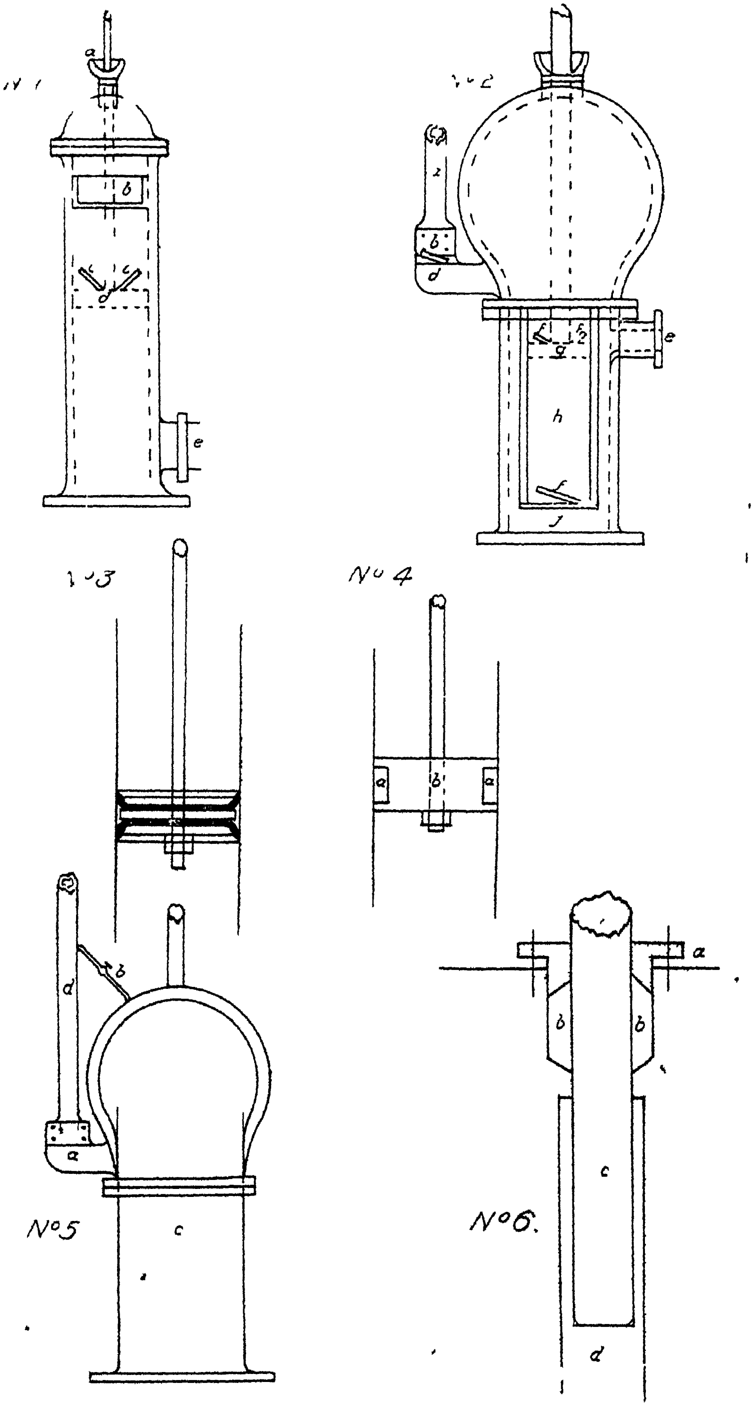
A better double action piston is one with cup leathers turned back to back (fig 3.) Treble throw pumps are made with buckets and cup leathers for clean water, but with external packing and glands for dirty water.

Single action force pumps work well driven by light wind mills, and are suitable for short pipe lines; double action pumps do better with heavier wind mills, and are more suited to longer pipe lines, and treble action pumps should have "power" wind mills or engines to drive them, and are the most suitable for a long length of piping.

Springs Alongside Rivers,

"Apex" writes:—Some two years ago Mr. Oswald Cawood bought the farm Van Staaden's Dam, Dist. Cradock, on which Mortimer Station is built. At the time, there was a permanent hole

No. 1.—**Suction Pump**—*a.* oil cup gland; *b.* discharge; *c.* flap; *d.* bucket.—No. 2.—**Single Action Syphon Force Pump.**—*a.* delivery pipe; *b.* door; *d.* valve; *e.* suction pipe; *f.* valve; *g.* bucket; *h.* pump cylinder. No. 3.—A better double acting piston with cup leathers (in black) turned back to back. No. 4.—An unadvisable piston (double acting).—*a.* hemp packing; *b.* piston.—No. 5.—A non-syphon pump showing branch pipe with tap for filling cylinder from above the delivery valve.—*a.* delivery pipe; *b.* branch pipe; *c.* pump cylinder. No. 6.—Externally hemp packed ram with gland for taking up wear from dirty water and sand.—*a.* gland; *b.* hemp packing; *c.* ram; *d.* pump cylinder.



Some Irrigation Reciprocating Pumps.

Description on opposite page.

of water on it, in the Great Fish River, measuring approximately 80 yards long by 8 yards broad and averaging 2½ feet in depth. From this hole trickled among the stones for 3 or 4 hundred yards, a small stream. It was nothing to look at, and many an engineer would have ridiculed the idea of irrigating with it, but not so the far-seeing owner who ordered a 6 inch centrifugal pump delivering some 500 gallons a minute at normal speed and a steam engine to work it. After an 18 months' daily pumping of not less than four hours the spring is as strong as ever. The "plant" is a powerful one, as we know them, delivering water 60 feet above the intake through 300 yards of piping, but economy has been studied and with the exception of wood to light the fire, the only fuel used has been old kraal mist which is on the spot and which apparently will last this engine for the next 20 years.

The waters are led direct to the lands in the day time if required, but as pumping never stops either night or day when the river is in flood, dams had to be provided. There are two of these, at present, the one 80 yards long by 30 yards broad and averaging 3 feet deep; the other is 800 yards long and 100 yards broad and averaging 2½ft. in depth. The lands are already 90 acres in extent but as there is suitable soil and slope to extend them for another 1,000 yards in length by 600 yards in breadth, they will rapidly increase and the owner is already considering the advisability of adding a much larger pumping plant to his present one.

A mile and a half further up stream there was also a little water showing above the sand for a distance of 200 yards, very narrow, and stagnant it looked. Here a 13 foot windmill was erected over a well sunk on the bank above the flood level, and for 18 months this little wheel delivered from 12 to 15 hundred gallons per hour whenever the wind blew in spite of there never being more than two feet depth of water in the well. Recently an 18 foot wheel has been put up, this made it possible to sink the well some 6 feet through gravel and sand to rock and the yield is now 2,000 gallons per hour whenever the wind is strong enough to take it.

A few miles still further up stream another 13 foot wheel was fixed a little while ago, pumping out of the river from a hole (it was scarcely worth the name, and water among the rocks would more accurately describe it). Just before the rains, when the mill had been working about a month but the river had not run for five months the owner ordered another one the same size to put into the river lower down; saying that the first had made no impression on the water although it had worked splendidly. Small pumping plants, very, some of these, but how valuable is this permanent water for lucerne where the owner has really first class "birds" and almost every farm along the Fish River through the Karoo has such springs. If this should encourage others to try their luck, let them not think that they can sink anywhere alongside the river and get water or there will be some disappointment. Perhaps some other time I may write about getting this spring water, and soakage from river beds.

Eradication of Prickly Pear.

Good work is being done in the Jansenville district with Scrub Exterminator (Arsenite of soda) for the eradication of Prickly Pear. One farmer, Mr. J. F. Heydenrych, of Buffelsfontein, reports having cleaned about 930 morgen in a very short time, and he intends going on with the good work by using the Scrub Exterminator, not only to clear the ground, but for destroying the young plants as they come up. Another farmer, Mr. D. F. Gouws, of Hottentotsfontein, reports that the exterminator worked splendidly when he used it over about fifty morgen of land. It completely destroyed all the prickly pear (over two hundred wagon loads) upon which it was used. In a further report Mr. Gouws explains that he mixes 1 lb. of Scrub Exterminator with five gallons of water and stirs it well for about half-an-hour or more. He then sprays over the pear which has been previously thrown in heaps.

"On Gates."—A Slight Misunderstanding.

We owe an apology to our valued contributor "Apex," in connection with his note on Farm Gates in the last issue—and incidentally an explanation to our readers. By an oversight the accompanying illustration contradicted the text in some of the details, which it is well to make plain. Referring to figure "C" in the diagrams the text read: "The dotted lines show how the rails should be let into the end posts and the centre posts let into the rails." Unfortunately there were no dotted lines in the diagram and the jointing was shown "checked out," which would be altogether unsuitable with the dimensions given. "Mortise and tenon" are the joints intended, in which case the further injunction that "no pegs should be used," &c., would be a sound instruction, as this is a common fault carpenters make in tenon and mortise joint, but would be nonsense if given for a "checked out" joint. Another palpable error crept in with reference to figure D., when our readers were solemnly informed that the parts should be bolted together with bolts "five inch in diameter." This should have been three-eighths of an inch. We trust we have made the matter clear and plain, and again express our apologies both to "Apex" and our readers for these oversights.

EXTRA-TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra Tropical Forests of other Countries.

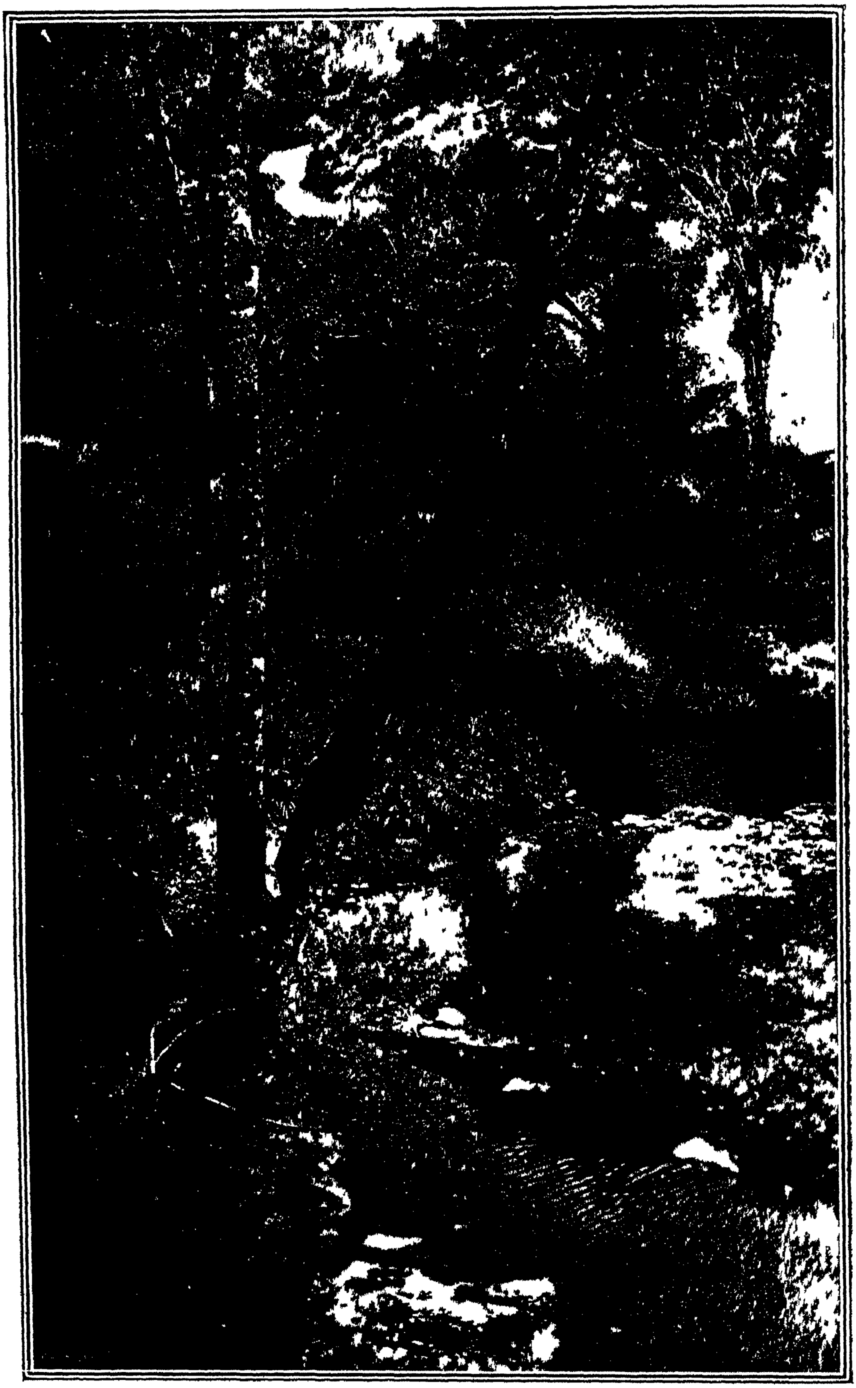
By D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town.

[This work will be continued from month to month till completed, when it will be published in book form.]

Preface.

This work on Extra-tropical Forestry in South Africa was begun in response to many requests for an enlarged edition of a pamphlet on tree-planting in South Africa that was published in 1893 and republished in 1899. The present, like the smaller work, refers solely to Forest trees planted for timber, water conservancy, shade or ornament, and to those adjuncts of trees—hedge and sand-stay plants. Fruit trees are only touched upon so far as they are useful also for these purposes. Nor are the beautiful and often valuable indigenous trees mentioned except such as are likely to be of practical use to tree-planters. As a rule, the indigenous trees of South Africa, on account of their difficult propagation, slow growth, and delicacy of constitution, are little suited to the purposes of the general tree-planter in South Africa. Few of them will flourish away from the damp warm climates of their sheltered kloofs and coast mountains; and only two or three, such as Cape Cedar (*Callitris arborea*), Sneezewood (*Pteroxylon utile*), Cape Box (*Buxus macowani*), the Silver tree (*Leucodendron argenteum*), and Stinkwood (*Ocotea bullata*), have qualities that are not equalled in the hardier introduced trees. To the scientifically-trained Forester belongs the task of restoring and raising to a higher utility the unique indigenous forest. But it is to tree-planting with the picked trees of larger and stronger extra-tropical forest floras that we must mainly look for a solution of those problems that now face the Forester in South Africa—the cheapening of timber, one of the main factors in the present high cost of living; some improvement in the climate and water conservancy; and, lastly, the keeping at home of the *one and a half million pounds* sterling that South Africa now pays for imported timber.

Comparing the Floras of the northern and southern hemispheres, Alfred Wallace says:—" Instead of the enormous northern area, in which highly organised and dominant groups of plants have been developed gifted with great colonising and aggressive powers, we have in the south three comparatively small and detached areas, in which rich floras have been developed with special adaptations to



A Forest Stream, Knysna.

(W. B Baker)

soil, climate, and organic environment, but comparatively impotent and inferior beyond their own domain" ("Island Life"). Comparing the forest floras, the Cape forest flora is a striking example of this weakness, while the comparatively large forest flora of Australia is an exception, and, in the southern hemisphere, a very striking exception.

A word of explanation may be necessary as to the use here made of the word "extra-tropical." To the South African and the Australian it is the land we live in. Cape Town, Sydney, Buenos Aires, and Valparaiso lie at about the centre of the Southern Extra-tropics with mean temperatures about 62° Fah. In the southern hemisphere it is the sea-level climate between about latitude 23½ and latitude 43½. This is pretty closely the limit of the indigenous temperate forest flora of South Africa and of temperate Australia. Thus defined "extra-tropical" is nearly the equivalent of the "sub-tropical" climate of the older writers. Sub-tropical is, however, a misleading term arising out of an insufficient knowledge of the great difference between tropical and the extra-tropical climates. These two climates offer a striking contrast. Besides the considerable difference in temperature, there is the great difference in the moisture conditions. Looking at moisture conditions, the typical extra-tropical climate differs more from either the cold or the tropical climate than these do from one another. If we class the world's climates under (1) cold, (2) extra-tropical, (3) tropical, the second is drier than either of the others. In extra-tropical climates are here included the typical climates of the Mediterranean and its eastward extension, of California, and of South America, of South Africa, and of Australia south of the tropic. To these must be added the more luxuriant climates of the Himalayas, of Japan, and of the Gulf States of the United States of America. In these three we have magnificent forests, the moisture conditions in Japan and the Himalayas being greatly improved by the irruption of monsoon rains during the summer. There are other extra-tropical climates (such as the Nilgiris in South India) produced by elevation within tropical latitudes; and, *per contra*, there is a large part of the world where, in extra-tropical latitudes, the climate is desert and forests non-existent. Extra-tropical climates fall naturally into three divisions, and *within these three divisions* the trees are generally interchangeable. Thus a Mediterranean tree may be expected to succeed at the Cape (South-west), California, and South-West Australia, or *vice versa*, but not a summer rainfall tree in a winter rainfall climate.

Extra-tropical Climates.

Winter rains.	Mediteranean countries, Persia, and east as far as Afghanistan—the largest purely winter rainfall area in the world. Cape (South-west). California. Australia (South-west and South). Mid-Chili.

Summer rains:	South Africa (except S.W. of Cape Colony). Mexico and highlands of Central America. Yunan, Mid-China and Korea. Himalayas. Abyssinia. Argentine north. Highlands generally in tropical latitudes.
All-the-year-round rains	Japan Gulf States, U.S.A. Mid-Argentine and S. Chili New Zealand and Tasmania Equatorial highlands

We may say that the presence or absence of technically valuable forest is governed by a minimum rainfall of 20 inches, while the successful selection of the technically valuable species, depends primarily on the amount and distribution of the rainfall.

The biggest trees in the world, the Eucalypts and Sequoias, occur in extra-tropical forests; and probably also, the largest and most rapid production of timber is in the extra-tropics.

The timbers of cold countries are mostly softwoods; hardwoods —most of them nearly worthless, abound in tropical forests: in extra-tropical forests both softwoods and hardwoods are fairly represented, though some cultivation may be necessary to adjust the proportion of each. Thus, Australia has a paucity of softwoods, while Japan, though not wanting in hardwoods, has more softwood than hardwood. That most valuable class of timbers, the durable softwoods, are specially characteristic of extra-tropical forests. There we find all or most of the species belonging to the genera *Juniperus, Callitris, Cupressus, Sequoia, Taxodium, Agathis, Podocarpus,* and other Conifers, together with *Cedrela.* It is true that Teak, the remarkable Hàzamalàn of Madagascar and a few of the Cedars are tropical, but the great bulk of durable softwoods are extra-tropical.

The groves were God's first temples. Ere man learned
To hew the shaft, and lay the architrave,
And spread the roof above them,—ere he framed
The lofty vault, to gather and roll back
The sound of anthems; in the darkling wood,
Amid the cool and silence, he knelt down
And offered to the Mightiest solemn thanks
And supplication.

Be it ours to meditate,
In these calm shades, thy milder majesty,
And to the beautiful order of thy works
Learn to conform the order of our lives.

(W. C. Bryant.)

INTRODUCTION.

OBJECTS OF FORESTRY.

The objects of Forestry in South Africa may be grouped under five heads:—

1. To cheapen the cost of living.
2. To get more from the soil, not less than half a million pounds sterling yearly in Cape Colony; and similar large sums in Natal and the Transvaal.
3. To find employment on the soil for a large population.
4. To improve the climate to some extent.
5. To promote arboriculture in a nearly treeless country.

It is unnecessary to do more than glance briefly at each of these five objects of Forestry in South Africa.

1. *To cheapen the cost of living.*

South Africa has long been notorious for the high cost of living and among the items of this expensive living the most conspicuous is house-rent. Whether one builds one's house oneself or rents it, the result is always the same,—an enormously high rental. In many cases, as much rent is paid per month in South Africa as would procure the same house for a year in England. The reason for this excessive cost of house-building is the dearness of timber and of labour. When all timber has to be brought a distance of 6,000 miles or more, from the Northern Hemisphere, it is easy to see why house-building must be costly. And unfortunately, it is the small house and cottage of the poorer classes that, in proportion, are the most costly. In the country a form of hut or hovel is common, in which, on account of the cost, very little wood enters. The roof is of thatch and the ceiling made of Spanish reeds, laid side by side and covered with earth. Forestry in South Africa will provide its poorer people with houses in place of hovels! Let us not forget President Roosevelt's recent happy definition of the chief object of Forestry—" the providing of homes for the people."

Absence of timber increases the cost of living not only by the actual dearness of the timber, but by its reaction on the wages of the artizan. When the artizan has to pay an exorbitant rent for a small house his wages must be high in proportion. Thus the scarcity of timber has a double action in raising the cost of living in South Africa; it raises both the price of wages and of raw material. In fact it is sheer waste to go on importing timber 6,000 or 7,000 miles from Europe or America when it can be produced from fifty to seventy five per cent. faster here. In the favourably situated coast districts of South Africa the growing season lasts nearly throughout the year, and thus we are able to show that large and rapid production of first-rate timber which is the envy of Foresters in less favoured climates. With its wealth of sunshine and shower we should learn to look on the accessible portions of the mountains of the southern and eastern coasts of South Africa as a great mine of forest wealth at present lying undeveloped. The climatic forest zone of South Africa extends from the Cedarberg (100 miles north of Cape Town) right along the coastal highlands to the north-east of the Transvaal.

Let us not forget, how abundant timber makes cheap living, in ways too numerous to mention. This we see in the quantity of timber used per head of population in those countries where it is cheap. In the United States of America the average consumption of timber per inhabitant is 85 cubic feet, and besides this 265 feet of wood fuel, altogether there is an average consumption of *nearly 1 cubic foot per head per day*. Germany uses 43 cubic feet per head per year, while England with her ruined forests has to make shift with only 13 cubic feet per head per year. With all the commerce, the colonies and the free-trade of England, living in Germany is less costly than in England, while the standard of comfort in the two countries is about the same. Of course in such a comparison one can only compare countries where the standard of comfort is similar. It would not do to compare England or Germany with Spain. President Roosevelt in a recent speech dwelt strongly on the necessity of forest resources in the making of happy homes. He described also the close relation between mining and forestry. Mines cannot be economically worked without abundant wood and water. There are rich mineral resources in some of the Western States of America that cannot be economically worked owing to the want of cheap timber. Much of the iron we have to import, could profitably be replaced by wood if only we had the right sort of timber in our midst. Shingles make a better roofing material than corrugated iron, durable timber fencing than iron fencing. In forest countries the poor man's house is built entirely of timber. This was the case in England before the forests were destroyed and is the case still all over Northern Europe. And very cheap, very pretty and very comfortable these wooden houses are. I have in my mind particularly those in the severe climate of the Black Forest country in Germany, together with the comfortable board and lodging in the rural hotels at 3/- per day! Here the forest supplies man's chief needs—house, fuel and manure for the poor soil.

The French have an old-time saying, that everything goes back to the forest.

2. *To produce yearly about half-a-million pounds worth more from the soil in Cape Colony, and similar large amounts in the other States of S. Africa.*

Before the war the average value of timber imported from oversea to Cape Colony was between a quarter and one-third of a million pounds sterling. At the conclusion of the war it rose to over half-a-million; and during the commercial activity and inflation following the war, the value of timber imported through the ports of Cape Colony amounted in 1903 to *over a million pounds sterling*. During 1903 the Customs Returns show that 10,704,893 cubic feet of timber, valued at £727,501, were imported. Of this timber about 10,317,064 cubic feet, valued at £687,491, came from Europe and America, and 387,829 cubic feet, valued at £40,010, in the form of iron-bark, Jarrah, Kauri and Kari, from Australia and New Zealand.

TIMBER PAYING DUTY.—CUSTOMS RETURN.

Unmanufactured wood imported into Cape Colony during this year ended 31st December, 1903.

Description.	Merchants & others.		Colonial Government.		Total.	
	Quantity C. Ft.	Value.	Quantity C. Ft.	Value.	Quantity C. Ft.	Value.
Ash	32,452	£4,617	108	£27	32,560	£4,644
Bass	24,297	3,103	..		24,297	3,103
Birch	3,909	466	..	..	3,909	466
Cedar	3,854	507	..	..	3,854	507
Cottonwood ..	337	65	..	..	337	65
Elm ..	845	172	6,283	1,375	7,128	1,548
Gum	5,261	539	..	..	5,261	539
Hardwood ..	2,134	232	25	10	2,159	242
Hickory	83,755	13,658	..	..	83,755	13,652
Ironbark	..	..	1,019	121	1,019	121
Jarrah	57,821	3,906	85,909	11,789	143,730	15,695
Karri	49,825	5,190	78,622	12,579	128,447	17.769
Kauri	114,633	6,425	..	..	114,633	6,425
Mahogany ..	8,005	2,698	..	..	8,005	2,698
Maple	2,110	288	..	..	2,110·	288
Masts and Spars ..	915	25	..	..	915	25
Oak	12,022	2,141	1,406	465	13,428	2,606
Pine	8,858,748	519,885	419,540	41,918	9,278,288	561.803
Poplar	91,643	12,319	..	..	91,643	12,319
Satinwood ..	52	34	..	..	52	34
Teak	141,942	42,045	70,130	21,483	212.072	63,528
Walnut	18,194	3,838	..	..	18,194	3,838
White	562	108	..	..	562	108
Staves No. ..	527,576	15,361	..	..	say 23,000	15,361
Other kinds ..	959	111	..	..	959	111
Total ..	10,041,851	637,733	663,042	89.768	10,200,317	727,501

In addition to the timber that paid duty the following timber was imported duty free for railway purposes :—

Sleepers ...	... ...	£196.737.
Other timbers	... ...	106,400.
Total	...	£303,137,

or altogether £1,030,638.

Neglecting the exceptional year 1903, but allowing for the expansion and growth of the Colony, we may take 8,000,000 cubic feet, worth £500,000, as the average yearly importation of timber, in the future, to Cape Colony. With an average yield of 150 cubic feet, to produce 8,000,000 cubic feet of timber would require 53,333 acres of timber plantations, which at £12 per acre would cost £639,996. The present area of plantations in Cape Colony is, in round figures 22,000 acres. If we assume a mean annual yield of 150 cubic feet, in these plantations we see that they are now yielding 3,000,000 cubic feet of timber per year, or rather more than one-third of the total importation of timber to Cape Colony. In a scheme propounded by me in 1903 it was estimated that an expenditure of half-a-million pounds sterling was required to settle the forest question in Cape Colony. It is noteworthy that France spends half a million pounds sterling *yearly* on forestry, Germany four millions, and Japan a quarter of a million.

Perhaps the yield from the indigenous forest may be considered as providing for the expansion of the Colony. This represents a comparatively large area of very poorly stocked forest. With improved communications and developments and better stocking, the indigenous forest will in the future represent a national asset of great value. For many years to come, owing to its poorly stocked condition and inaccessibility, the yearly yield from the indigenous forest may be taken as not exceeding one million cubic feet. For the last fifteen or sixteen years the Knysna Forests have produced 100,000 sleepers, or about 250,000 cubic feet yearly; but it seems to be becoming increasingly difficult for the Yellow-wood sleeper to compete with the imported. This is not to be greatly regretted, since the most suitable employment for Yellow-wood is as a flooring-board.

Timber sold in the Knysna, Eastern and Transkei Conservancies during the five years 1899-1903.

	cubic feet.	
Knysna ..	1,797,505¾	also 64,118 running feet Kamassie.
Eastern ...	1,365,527½	also 26,361 poles, etc.
Transkei ...	479,156	

3,642,189 c. ft., or 728,438 cubic feet yearly.

TIMBER IMPORTS TO THE TRANSVAAL.

During 1902 the value of timber imported into the Transvaal amounted to £342,660, of which £275,332 is classed as "unmanufactured" in the Customs Return (Govt. Notice 50 of 1903.) This is exclusive of Furniture and Cabinetware which was imported to the value of £373,175. Altogether timber in its various forms reached a total value of £715,835 for 1902, exclusive of timber and wood imported free for Government use, civil and military. This may represent another £200,000 worth, bringing up the grand total of the Transvaal's timber bill for 1902 to something not far short of a million sterling. We may perhaps assume £750,000 as the normal yearly timber bill of the Transvaal for house building, mining and railway timber, including manufactures to such an extent as doors and window frames, but excluding articles such as furniture where the manufacture represents the major portion of the value.

The yearly value of timber imported into Natal, Orangia and

Rhodesia for home consumption during the next five years will not average less than £250,000.

Thus, the normal yearly timber bill of South Africa may safely be assumed to amount to not less than 1½ millions.

Cape Colony	£500,000
Transvaal	750,000
Natal, Orangia and Rhodesia ...	250,000
	£1,500,000

The primary object of the Forest Department is to produce the timber in South Africa.

3. *To provide Employment for a large Population.*

It is self-evident that the production of one and a half million pounds worth of more or less manufactured timber provides employment for a large number of foreigners. It should be the business of South Africa to have this production within its own borders, and thus to provide work for a large working population of both white and coloured people. It is noticeable that the best woodcutters and bush-workers are those at Knysna, and the bulk of these are white. Perhaps they represent the largest class of white labouring population, working with their hands out-of-doors in South Africa; and possibly this is due to the fact that their work is largely in the forest where they are sheltered from the enervating South African sun. It should be our duty to foster and encourage this white labouring population. Algeria with a similar climate has a white labouring population of not less than two millions in the Kabyls. In Germany the wages of people employed on forest industries amount to something like thirty millions sterling! It is computed that about one million people in Germany are employed working directly in the forest, while another three millions derive their living from industries directly dependent on the forest.

4. *To Improve the Climate to some Extent.*

The climate of South Africa is mainly the result of its position on the globe and its topography. No amount of tree-planting in the Karroo, for instance, (supposing that extensive tree-planting were possible there, which it is not,) would alter the desert character of that country. The real climatic utility of tree-planting in South Africa is to clothe its barren mountains with rich soil and forest humus. Forest humus forms a rich soil but it does more. Forest humus represents a vast sponge with extraordinary absorbent powers. Forest humus holds nearly ten times as much water as the barren sandy soil it would replace in South Africa. The sterile (sour veld) sandstone mountains of South Africa which girth the greater portion of its coast, have an undoubtedly pernicious effect on its climate. They drain much of the moisture from the meagre rain clouds and rush it off in short-lived torrents to the sea. The great useful effect of forest in South Africa lies in its vast storing capacity. Along the coast the rainfall is generally enough for man's needs, but it is capricious in its advent. Deluges of rain too often follow long periods of drought, hence the great problem for South Africa, recognised on every side, is the conservation of water. In no way can water be conserved on a large scale more naturally, more certainly, and more economically than by the forest soil. No doubt the forest has other beneficent *climatic* effects, but they are quite overshadowed by the enormous gain to be derived from the equalising effect of forest on the rainfall.

It is probable that the actual fall of rain will be increased to some extent by the restoration of the forests. When a drought has once started, the land becomes heated, and rain-bringing weather movements (cyclones and moving anticyclones) pass over without rain, until a very pronounced storm moistens and cools the heated earth and starts precipitation. Then smaller storms, which would have passed over the heated earth without bringing rain shed their showers. Now, one of the proved effects of forest, an effect which is confirmed in all balloon ascents, is that the air above the forest is cooler and damper. This effect arises from the fact that (1) the foliage of the trees arrests, and to a certain extent, uses up the heat in the sun, (2) the shelter of the trees lessens and prolongs evaporation. In a climate like South Africa, where the heating effect of the sun and drying effect of the air are very marked, this moisture conserving action of forest is important, not only for its own sake but because of its inducing more rain. At Nancy, France, experiment has shown that during summer, when conditions resemble those in South Africa, five times as much water is evaporated outside the forest as within it. My observations in Cape Colony with the Pickering Evaporimeter both near the coast and inland show an evaporation amounting to about four times as much outside the forest as in it; but this figure is no doubt somewhat too low, as the instrument does not work correctly in very dry or hot weather.

Another effect of forest growth is produced by the roots of the trees. These penetrate between crevices of massive rock and split and rend the rock. They gradually open up barren, clayey soils and thus add to the water-holding power of the vegetable humus sponge.

Thus, we see that the forest has some action in increasing rainfall, but what that exact action is it is difficult to prove by experimental observation. We know, however, that in countries with the South African climate where forest once existed and has been destroyed, such as in the Mediterranean region, lands that were once fertile are now sterile. There is historical evidence that the whole of North Africa has become drier since Roman and pre-Roman times. Horse and mule transport were once practicable in the northern Sahara where only camel transport is now practicable. Fertile grain-producing lands are now desert and deserted. Dry river beds, with their rounded water-worn pebbles, show where water once flowed. Lakes have become salt-pans. It is reasonable to assume that in a climate such as that near the coast of South Africa where the clouds bring a supply of moisture, the action of

Road through Knysna Forest, Millwood.

(W B Baker)

forests is both to increase and to equalise the amount of rain; but undoubtedly the great and beneficial action of forests is to retain the rain when it falls, and to keep for our use the water, and indeed soil, too, which we see rushing away in foaming torrents of muddy water after every burst of rain.

This general effect of forests must not be confounded with the local drying effect of quick-growing trees such as Eucalypts and Wattles. Plant a few Blue-gums, or other very quick-growing trees, near a swamp or a stream of water, and they will promptly dry it up. Here we have a small, but a very apparent, and sometimes annoying, local effect which must not be confounded with the general effect of masses of trees covering barren mountains. All trees have a double effect on water supply, a water-exhausting and a water conserving action, and it will depend on circumstances which is the more powerful. Thus, to plant Blue-gums, or other quick-growing trees, around the water supply of a town would probably injure that water supply. To plant Oaks, Cypresses, or slow-growing trees with dense foliage, around the same water supply would probable increase it. To cover a bare mountain with a forest of Pine would produce some increase in the rainfall of the mountain, and it would increase and equalise the yield of the streams flowing from the mountain to a large extent. Pines transpire little moisture. According to Von Hoenel's experiment only on an average one-eighth that of broad-leaved trees such as Oak. Scott-Elliot says one-sixth.

"On looking for the stomata of pine leaves, it will be found that they are sunk below the surface of the leaf. This arrangement hinders the ready escape of water, so that there is but little transpiration, and, in fact, a pine gives off only about one-sixth part of the water transpired by an average oak tree, or other Dicotyledon, in the same time." (*Nature Studies.*)

Several cases have been brought to my knowledge in South Africa where streams have dried up or diminished after clearances, and have again increased in strength with the restoration of the forest. At Knysna the roads are only kept dry enough to be passable by cutting, and by keeping cut, at considerable expense, the forest bordering the roads. To produce its full moisture conserving effect the forest must be dense and composed of slow-growing species.

This, then, is the action of forest on moisture under ordinary climatic conditions. Under certain extreme conditions of drought, trees of all kinds will lower and exhaust the little remaining sub-soil moisture, while their watery exhalations will have little appreciable effect in moderating the parched atmosphere, and their protective covering to the soil is of no use since all superficial moisture has vanished. In America, Australia and other countries there usually exists a belt of poor open forest between the dense forest of the fertile country and the treelessness of the quite arid country. A large part of Southern Rhodesia is so situated. It is probable that in the open forest of this intermediate zone, the trees exhaust more moisture than they conserve, at any rate during droughts, and can thus only subsist in a sparsely scattered condition Scattered trees and open forest in most cases exhaust more moisture than they conserve. Hence the erroneous conclusions not infrequently drawn by unskilled observers as to the true action of complete, viz., dense forest. Very fast-growing trees such as the Casuarina in India, the Blue-gum and other Eucalypts in South Africa, use up enormous quantities of water in their vegetative process, and usually (especially as young trees) exhaust more moisture than they conserve. This has happened with the Casuarina plantations in Mysore and the Braamfontein plantations near Johannesburg. A common effect of Blue-gum planting may be referred to here. The Blue-gum is a native of a cool, damp climate. When planted in a dry, warm climate, it is singularly active in drying up marshes, wells, springs, and all moisture that is within reach of its powerful vegetative functions. The Blue-gum is entirely ill-placed in the streets of a town where its roots can reach gardens and their water supply.

To obtain the maximum water-conserving action of forest dense masses of slow-growing trees (preferably of the pine class) should be planted.

5. *To promote Arboriculture in a Treeless Country.*

A large portion of the work of the Forest Department consists in the general promotion of Arboriculture on private lands throughout South Africa. This general assistance to tree-planting may take three forms :—

(*a*) Advice.
(*b*) Practical demonstration.
(*c*) Distribution of cheap plants and seed.

Advice is given at the Conservators' Offices and in the various plantations and forests. Much time is necessarily consumed in replying to enquiries which arrive from all parts of South Africa.

Practical demonstration is afforded in the various plantations and forests. The largest of the plantations near Cape Town are so arranged and labelled that it is easy for those wishing to see the trees to identify them and to compare their growth under varying conditions. The forests and timber plantations in Cape Colony are everywhere open to visitors, certain precautions only being required to guard against fire during the dry season.

Distribution of plants and seeds.—Plants and seeds are distributed at cost price in the various Government nurseries. The nurseries being worked on a large scale, well organised, and under favourable conditions, young trees can be distributed from them at a fraction of the cost at which they can be bought in the open market. The current price for nurseryman's timber trees in the Transvaal has averaged £2 per 100! Even hedge plants are charged at this high rate. The cost at which trees are sold from the

Government nurseries varies from 4s. per hundred upwards. All the trees that are grown on a large scale are sold at 4s. per 100 from the forest nurseries near Cape Town, and the rates are not much in excess of this in other nurseries. These prices are for young plants securely rooted in tins.

Seedlings from the beds, which require further nursery treatment before planting, are sold at about one-tenth of this rate, or 4s. per 1,000. Sometimes it is possible to send seedlings by post to a tree-planter in a part of the country so distant that it would be impossible for him to obtain young trees in any other way. In such cases the seedlings are taken out of the earth and packed in moss or leaves. There is naturally some risk in doing this.

Cuttings are also sold in the case of those trees that can be easily raised from cuttings, the prices of cuttings being 3s. per 100 from the nurseries near Cape Town.

Planes, Willows, Poplars, Mulberry, Tamarisk, Juniper, and Manatoko (*Myoporum insulare*) are usually propagated from cuttings.

A large proportion of the most useful trees are, and would, under any circumstances, be unobtainable in the open market.

Seeds.—Seeds are distributed at cost price from the various forest centres, but the bulk of the distribution takes place from the Central Seed Store at Cape Town. As far as possible seeds are collected from the timber trees in the Government plantations (see below under "Seed"). Seed from the Government plantations is not only true to name and of good germinative quality, but it can generally be collected at a fraction of the cost at which it could be imported, the only notable exception being Cluster-pine. Seed collected locally is treated, when necessary, by trial sowings in the Government nurseries. The use of the seed store, both for distributing to the Government plantations and to the public, ensures a large turn-over, and prevents the accumulation of old seed.

THE CASE FOR NATIONAL FORESTRY IN SOUTH AFRICA.

There is but little timber in South Africa for mining, house. building, and Railway work, and, as we have seen above, the value of timber imported to South Africa amounts to not less than £1,500,000 yearly. This 1½ million capitalised at 3 per cent. represents a capital of 50 millions. Until South Africa settles the forest question and grows its own timber, this is what neglect of Forestry costs the country—1½ millions, yearly representing at 3 per cent. a capital of 50 millions. These are big figures! Forestry is one of the most serious questions before the country. Thus 50 millions is nearly double the total cost of the Cape Government Railways, which up to the end of 1903 had cost 26¾ millions (Rep. of Gen. Man.). At the same date the Cape National Debt amounted to 45 millions, so that neglect of the forest question is costing South Africa more than the Cape National Debt. We thus see the correctness of the statement frequently made by the late Colonel

Schermbrucker, that a well-organised system of Forestry on the German model would go far towards repaying the cost of the National Debt, for, if 20 years ago we had followed his advice, we should now be in the way of supplying South Africa with timber? Considering Cape Colony alone, if we take half a million as the average value of the timber imported to Cape Colony, that capitalizes at 16½ millions—say one-third the National Debt.

S.A. National Debts, 1903.

Cape	46	million	pounds	sterling.
Natal	11	,,	,,	,,
Transvaal	65	,,	,,	,,
Total ...	122	,,	,,	,,

Cape Colony has a debt of £100 per white head—men, women, and children. England's debt amounts to £20 per head.

In October, 1904, Mr. Merriman stated the Cape National Debt at 50 millions, with yearly charges amounting to 2 millions.

It is a mistaken view to look on minerals and agriculture as the sole sources of the country's productiveness. Minerals are at best a temporary source of wealth. Too frequently they cost as much to win as they are worth, and their real value lies in the attraction they offer to outside capital. This has been the case in Australia, where reliable calculations have shown that the total value of all the gold produced scarcely equals the capital spent in producing it.

Agriculture it is possible to over-rate as compared with Forestry In 1903 Cape Colony imported £1,457,000 worth of wheat as compared to £1,030,638 worth of timber. In 1902, while the Transvaal spent £275,332 on unmanufactured timber, only £245,709 was paid for all the wheat and wheaten flour. Timber is more costly to import than wheat, being for equal value more bulky. Agriculture in South Africa is at the mercy of an uncertain climate. It needs the support of a more certain industry such as Forestry. It is a singularly fortunate circumstance that for well-placed Forestry, *i.e.*, along the line of the southern and eastern mountains of South Africa, there is no climatic risk. When droughts desolate the Colony generally they are scarcely felt in the neighbourhood of the coast mountains; and when drought destroys agricultural crops it causes only a temporary loss of growth to the forest, provided always that the forest be well-placed.

We yearly deplore the ever-increasing quantity of food-stuffs imported. We call in the Railways, the Guano Islands, and the general taxpayer to help the farmer. And, rightly, for the farmer is the chief producer, and the balance of trade is terribly against us. But it is doubtful if the farmer can be legitimately helped more than he has been during the last twenty years. According to the evidence of the Superintendent of the Guano Islands (Select Committee, Leg.

Coun., 1904), the Guano subvention to the grain farmers of the South-west, costs Cape Colony £40,000 per year. It is probable that as population increases we shall have to submit to a yearly increasing bill for imported foodstuffs; as is indeed the case with most of the nations of Western Europe. The balance of trade is against Great Britain to the extent of about 100 millions yearly, and this is held to represent the interest on accumulated capital. In a new country such as South Africa there is little accumulated residental capital—(if I may use the phrase) and it is agreed on all hands that the problem facing the country is *how to increase its productiveness and so help to restore the balance of trade.* Manufactures can only increase slowly as population increases and labour and living become cheaper. Forestry offers the means of materially reducing the cost of living and increasing the productiveness of the country by at least 1½ millions yearly. Now, how is Forestry going to do this? In 1897 I stated the case for Pine plantations in these words:—

PINE PLANTATIONS.

"During 1896 the quantity of pine wood imported into Cape Colony amounted to 4,967,945 cubic feet, valued at £215,693. The greater portion of this importation could be supplied from *properly grown* Cluster-pine plantations. It might be found necessary to zinc or otherwise treat the Cluster-pine but experiment at Genadendal indicates that it may be successfully used in every class of building, without any special preparation. Zincing would render Cluster-pine more durable and *far less inflammable* than the present imported timber. As was shown in my annual report for 1895 five farms of 6,000 acres (the Malmesbury farms average about 6,000 acres each) planted with Cluster-pine, would supply the whole present demand for imported pine and deal wood; 30,000 acres (47 square miles) planted at £2 per acre, ploughing and sowing broadcast would cost £60,000. Quadrupling this expenditure for interest at 4 per cent. for 35 years (vide the calculation given at page 26 of my Annual Report for 1895) we arrive at an expenditure of £240,000.

"For this expenditure the country would obtain timber which costs us now £216,000 *yearly.*"

In other words, for every £1 spent now on planting, the country would reap an annual revenue of about £1 in 35 years and nearly a quarter of a million pounds sterling would yearly be kept in the country, instead of being paid to the foreigner.

A TIMBER PLANTATION FOR HOUSE-BUILDING TIMBER.

If the Cape Government borrows at 3½ per cent. to plant a timber plantation which costs per acre £1 for land and £7 for planting, or altogether £8 per acre, at the end of 60 years that plantation has cost with interest £63. If we take house-building timber as worth 6 pence per cubic foot as it stands in the forest, the timber plantation has to produce at the end of 60 years only 2,520 cubic feet to enable it to repay all expenses with interest. But 2,520 feet at the end of 60 years would be a very low yield. It equals a mean yearly yield of only 42 cubic feet per acre. Now in South Africa it is a poor pine plantation that does not make 150 cubic feet per acre per year.

Here it is assumed that thinnings pay the cost of maintenance and up-keep. This is an assumption commonly made and it is an assumption altogether in favour of the forest when, as in Cape Colony, there is a good demand for firewood and smaller timber. Six pence, too, is a somewhat low price for coniforous wood standing in the forest, but it may be taken as a general average. In the neighbourhood of Cape Town the figure would be nearer one shilling per cubic feet.

AGRICULTURAL SHOWS IN 1905.

Date Fixtures.

The following dates have been fixed for the Agricultural Shows in 1905:—

Paarl, at Paarl, January 19.
Robertson and Montagu, at Robertson, February 8.
Worcester, at Worcester, February 15 and 16.
Bredasdorp, at Bredasdorp, February 16.
Western Province, at Rosebank, February 22, 23 and 24.
King William's Town, at King William's Town, March 2 and 3.
East London, at East London, March 8 and 9.
Bloemfontein, at Bloemfontein, March 15 and 16.
Port Elizabeth, at Port Elizabeth, April 5, 6, and 7.
Bechuanaland, at Mafeking, April 12.

The Cala Show is to be held in the month of March, but the date is not yet fixed.

C

FLUKE OR SLAK IN THE LIVER OF SHEEP.

CALLED ALSO LIVER-ROT AND SHEEP-ROT.

By the Chief Veterinary Surgeon, D. Hutcheon, M.R.C.V.S.

This is what is termed an enzootic disease, or one that is confined to certain localities, where alone the conditions necessary to its production exist. These are fresh water vleys, damp marshy places, and situations liable to be flooded during the summer and autumn. It is also much more prevalent in such localities during wet seasons, more especially when they follow each other for two or three successive years.

The late Prof. A. P. Thomas, M.A., F.L.S., of Auckland, New Zealand conducted an investigation into the origin and evolution of this disease on behalf of the Royal Society of England, twenty years ago. These investigations were commenced by Prof. Thomas in June, 1880, and completed about October, 1882. By these researches he succeeded in tracing the complete cycle of the forms which occur in the life history of these *entozoa.*

Nature of the Disease.—It is really a parasitic disease and is due to the presence in the bile-ducts of the liver of the affected animal of a large number of flat worms, known as Liver-flukes, from their resemblance to the flat fish called a fluke or sole. There are two species which affect our domestic herbivora, called respectively the *Distoma hepaticum* and the *Distoma lanceolatum.* The former is the more important, being larger, more common, and existing in larger numbers. It is found in the livers and bile-ducts of cattle, buffaloes, sheep, goats, antelopes, and camels. It is also found in the livers of the horse, ass, pig, elephant, and rabbit, and even in man. The latter is frequently found along with the other, in the bile-ducts of ruminants, and has also been found in the dog, cat and man. The *Distoma hepaticum*, or liver-fluke has the shape of a privet leaf, or of a small sole, it is of a pale brown colour, and is about an inch or an inch and a third in length, and in breadth about half its own length. At one end is a narrower projecting portion, this is the head and at its tip is placed the mouth, in the middle of which there is a small sucker or sucking cup by which the fluke can attach itself. At the point where the head joins the body, and on the under surface there is a second sucker called the ventral sucker, hence the name of Distoma, two-mouthed or two-suckered.

Coloured Plate.—The coloured plate with this article shows a section of the liver with matured fluke crowded together in the main bile ducts.

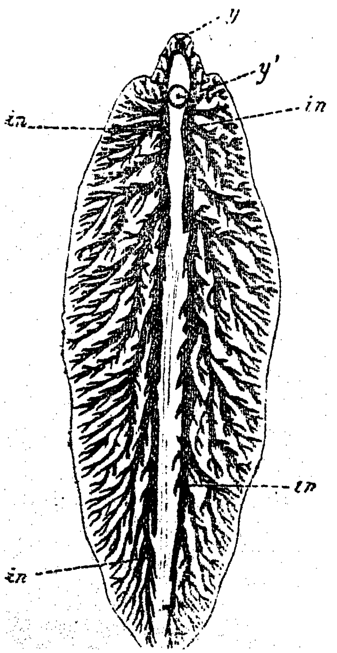


FIG. 1. An adult fluke showing the branched digestive tract; *y*, the oral; *y'*, the ventral sucker; *in*, the branched intestine. In the centre between the two main branches of the intestine lies the chief trunk of the water vessel. Twice the natural size. (W.H.I.)

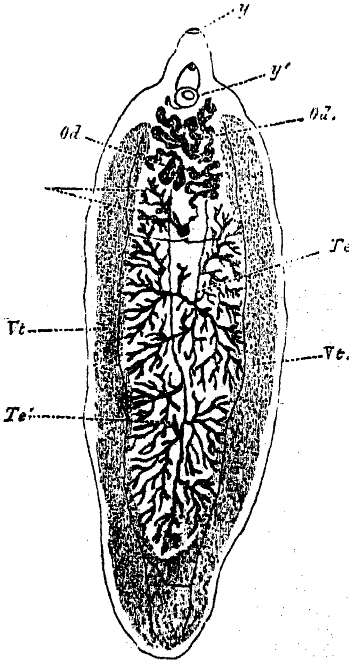


FIG. 2. Another view of an adult fluke, showing the reproductive organs; *y*, the Oral; *y'*, the Ventral Sucker; *Od*, the Oviduct; *Ov*, the Ovary; *Vt*, the Vitellarium or gland that forms the granular yolk-cells surrounding the embryo in the egg; *Te*, the Anterior; *Te'*, the Posterior testis; their ducts run forward. (W.H.I.)

As already remarked our knowledge of the development and metamorphosis of these flukes was very incomplete until Professor Thomas discovered that its intermediate host was a small snail, the *Limnœus truncatulus*. He says:—

"The snail or slug which harbours the first, second, and following generation is called the intermediate host, the back-boned animal being the ultimate or final host, and there is a constant alternation of one generation living its adult life in the back-boned animal, and of one or more generations in the snail or slug. This is an example of what naturalists call an alternation of generations.

"In the case of the liver-fluke, there are at least two generations which live the whole of their adult lives in the particular snail which has now been clearly proved to serve as the intermediate host of the fluke. The third generation arises as a germ in the snail, and, whilst still a minute larva, passes in the manner explained below into the sheep. That is to say, supposing we start with the fluke as it is found in the sheep, its child does not grow up into an animal like the parent, nor does the grandchild do so. Both child and grandchild look very different from the true liver-fluke, and live in the snail, but the great-grandchild forming the third generation does, as a rule, grow up into a true liver-fluke, and live in the sheep."

Without going into minute details, the adult fluke, whilst living in the bile-ducts, produces a vast number of eggs. Thomas estimates the number of eggs produced by a single fluke at half a million; they are very minute, about $\frac{1}{200}$th of an inch in length. They can be readily seen by the aid of a low power of the microscope, in the bile of the liver of an affected sheep. These eggs enter the intestines along with the bile, and passing along the intestines, they are ultimately distributed all over the veld with the droppings of the animal. If they fall on wet or marshy ground, or are washed by rain into vleys or into those small mountain-streams, where they meet with the requisite moisture, "further changes occur, and in each egg is formed the first generation or animal."

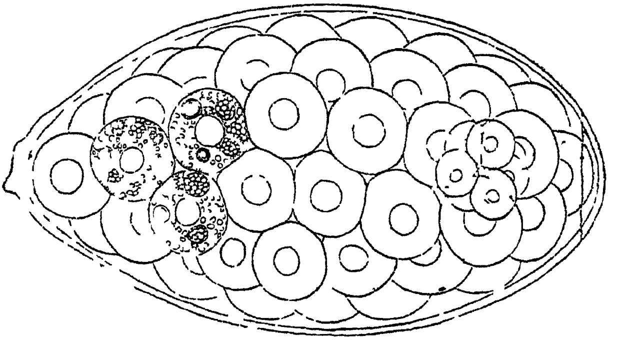


FIG. 3. Egg of the Liver-fluke examined shortly after it was taken from the liver of a sheep. At the right hand end of the shell may be seen the line marking off the lid, and a little to the left the embryo in a very early stage of development. The embryo is surrounded by round masses which serve as food. They are all of them granular but only three at the left-hand side have been fully drawn. Magnified 680 times. (THOMAS.)

Professor Thomas found that the temperature exercised a considerable influence on the growth of the embryo within the egg. "A temperature of about 74° to 78° Fah. is the most favourable, and then the embryo is formed in about two or three weeks; with less warmth the progress is slower, and with an average temperature of 60° the growth occupies two or three months. Whilst the temperature is very much below this, as in winter time, the egg does not change at all." As soon as the embryo becomes fully developed within the egg, it bursts the shell, escapes through the opening, and at once goes in search of its new home, which Professor Thomas found was a particular kind of water-snail, known as the *Limnœus truncatulus*. Into this snail the embryo enters by means of a sort of boring tool, which is situated in its head. The embryo seems to know the right kind of snail, for Professor Thomas tried several other fresh-water snails, but in only one other kind of snail did he find that

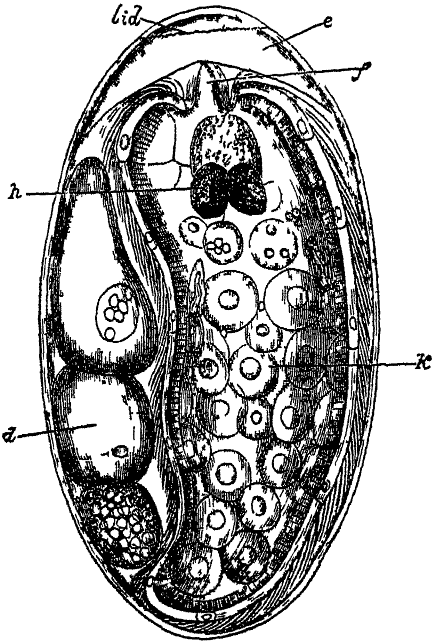


FIG. 4. Egg of the fluke containing an embryo ready to hatch out; *d*, masses of food; *e*, cushion of jelly substance; *f*, boring tool of the embryo; *h*, eye spots; *k*, germinal cells. Magnified 580 times. After A. P. THOMAS.

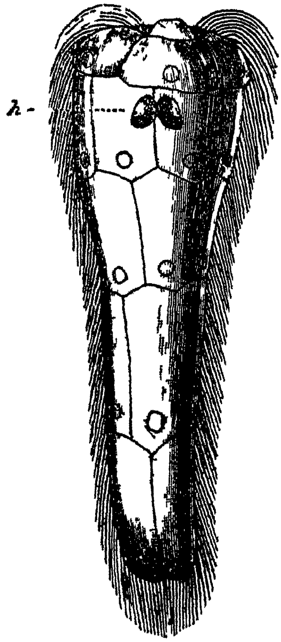


FIG. 5. An embryo as it appears when swimming in the water; *f*, boring tool; *h*, eye spots. Magnified 500 times. After THOMAS.

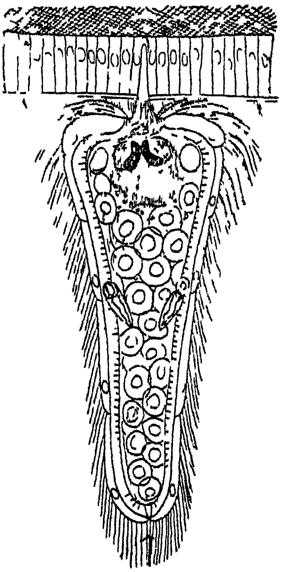


FIG. 6. Embryo of liver fluke, boring into a snail, only a very small part of the snail has been drawn. Magnified 370 times. After THOMAS.

any embryos had entered; it is called *Limnæus pereger*. It is evident, however, that some other snails are capable of acting as the intermediary hosts because *Fluke* exists where the *Limnæus truncatulus* is not found.

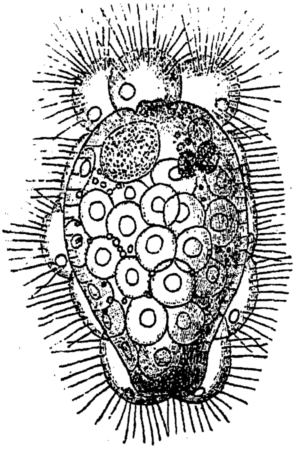


FIG. 7. Shows the change of the embryo into sporocyst just after it has entered the snail. (THOMAS.)

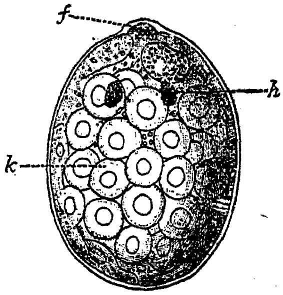


FIG. 8. Shows a young sporocyst produced by the change of the embryo; *f*, boring tool; *h*, eye spots disappearing; *k*, germinal cells, Magnified 500 times. (THOMAS).

The natural place for the further growth of the embryo is either in or near the lung of the snail. Once safely lodged in the suitable position, the embryo undergoes a great change of form, &c. The first complete change is into a sporocyst or bag of germs. In the second change, these germs develop within the sporocyst, into what are called *redia*, there being about half-dozen in each sporocyst. These redia, after leaving the sporocyst, migrate from the lung into the other organs of the snail, and particularly the liver upon which they feed.

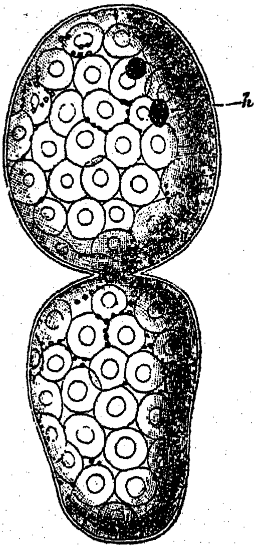


FIG. 9. A young sporocyst dividing into two; *h*, eye spots disappearing. Magnified 500 times. (THOMAS).

An adult redia contains about a score of germs; these escape from the parent by a special opening, and then crawl and wriggle their way out of the snail. This third generation of germs is called *cercaria*, they are provided with tails like a tadpole, by which they propel themselves through the water. "The free-swimming life of the cercaria never seems to last long, for on coming in contact with the sides of the aquarium, or the water plants contained in it, the animal soon comes to rest, draws its body up into a round ball, and exudes from the whole of its surface a gummy substance containing

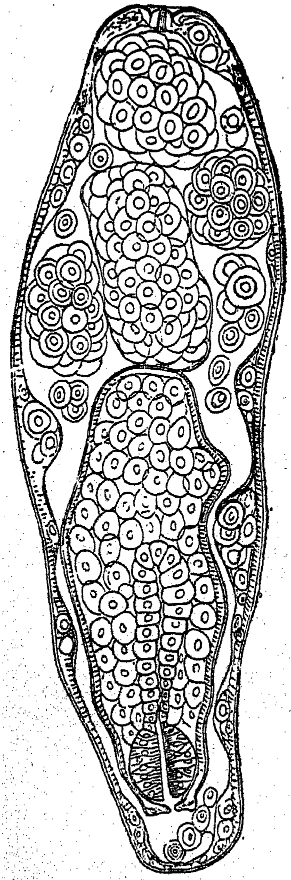


FIG. 10. A full crown sporocyst (the first generation) of the liver fluke. It contains several germs in different stages of growth, the largest at the lower end has assumed the character of a redia. Magnified 230 times. (THOMAS).

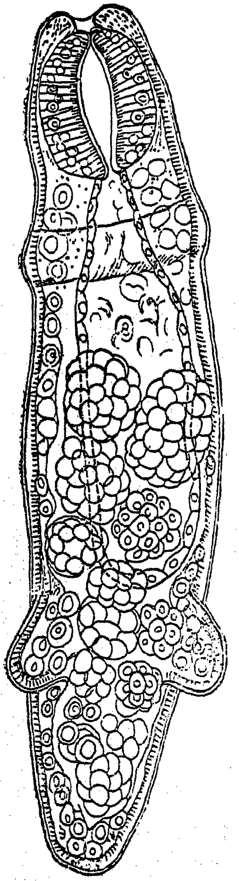


FIG. 11. A young redia (second generation) of the liver fluke, with the constents forming into germ, of the third generation Magnified 230 times. (THOMAS).

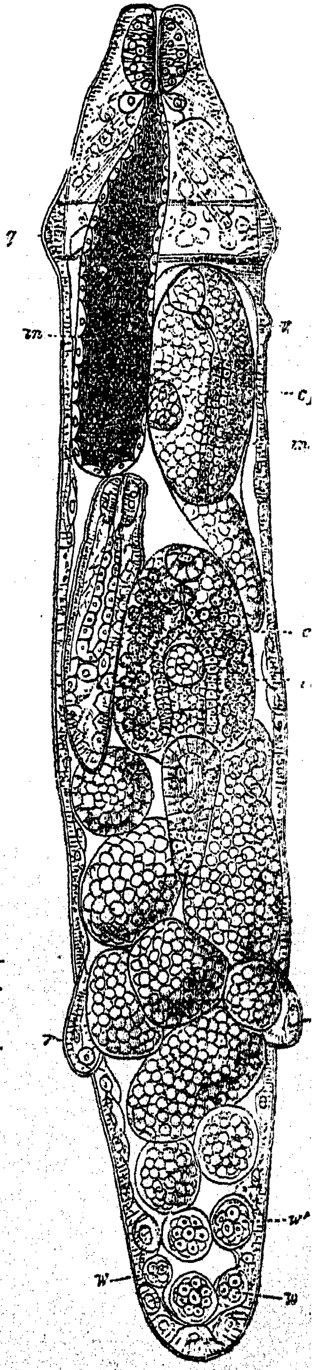


FIG. 12. A full grown redia (second generation), of the liver fluke, It contains a large number of germs of the third generation. Two of these are so far advanced that they show the characters of the tailed larva or *cercaria*. It contains also on the left-hand a young redia; c^1 and c^2, the two *cercaria*; *w*, *w'*, germs in a very early stage; *in*, the intestine of redia; *r*, the opening by which the *cercaria* leave. Magnified 120 times. (THOMAS).

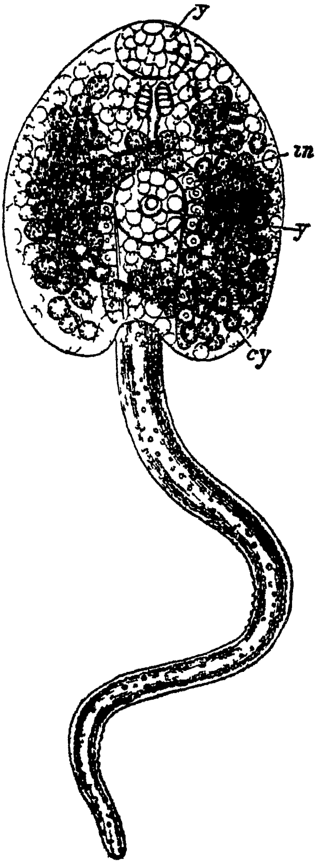


FIG 13 A free *cercaria* (third generation) of the liver fluke as it is seen when swimming in the water *y*, *y* the two suckers corresponding to the suckers of the adult fluke, *in* intestine *cy* the rounded masses of the sides of the body which provide the material for the formation of the cyst or envelope Magnified 160 times (THOMAS)

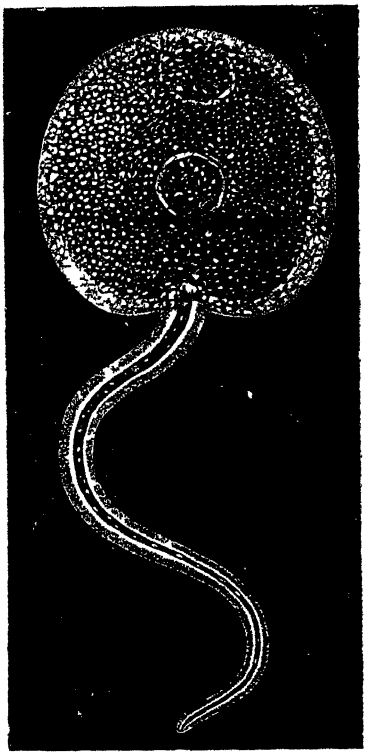


FIG 14 A *cercaria* in the act of forming its cyst or envelope Magnified 160 times (THOMAS)

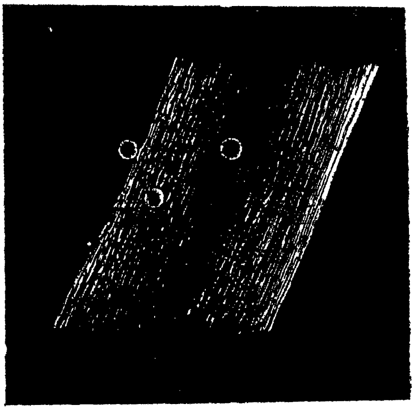


FIG 15 Three cysts of the liver fluke attached to a portion of grass stalk Each cyst contains a young fluke which remains quiet until the cysts are swallowed with the grass by a sheep when grazing Magnified 10 times (W H I)

many granules. The tail meanwhile is wagged violently, and before long a more vigorous movement throws it off altogether. (Theobald says it is drawn up). The gummy substance hardens on exposure, and the body of the cercaria is thus enclosed in an envelope which protects it from injury. If the snails are crawling on the margin of a ditch or over a damp field, the cercaria, on leaving the snail, at once proceed to form their envelope or cysts at the bottom of the grass, and so attach themselves to the stalks or leaves near the roots. These cysts are the form in which the liver-fluke is swallowed by the sheep, and the animals within them are young flukes. They remain adherent to the grass until the time comes when they are picked up by the sheep feeding on the ground. If the cysts are not swallowed within a few weeks, the young flukes will perish."

By tracing the generation of germs:—"The number of cercaria descended from a single fluke-egg cannot be fewer than 200, and is sometimes much larger. For the rediæ, forming the second generation instead of producing cercariæ may, and perhaps as a rule do, give rise to another generation of daughter-rediæ resembling themselves, and these then produce cercariæ. When this is the case, a single fluke-egg may give rise to more than a thousand cercariæ. It will be seen, therefore, that not only does the race of the liver-fluke multiply and increase abundantly in the sheep by producing myriads of eggs, but there is a further and great increase of the forms within the snail. If only the greatest degree of ordinary increase were reached, a single fluke might give rise to more than a hundred million descendants in the next generation of liver-flukes proper inhabiting the sheep. But fortunately for farmers the chances are enormously against any such disastrous increase."

The following is the description of the snail as given by Prof. Thomas:—"*Limnœus truncatulus* is a fresh-water snail with a brown, spiral shell; it is very common, and has a very wide distribution over the world. It is very small, its shell never reaching more than half an inch in length, whilst it is usually much smaller; a common variety in England scarcely ever measuring so much as a quarter of an inch . . . . . Although so common, it is often difficult to find; no doubt owing to its minute size and its habits of wandering from the water. . . . . . That the snails can live on moist ground, quite away from any quantity of water, for considerable periods, is sufficiently proved by the fact that I have kept them alive for eleven weeks on moist grass and moss, even when infected with the larval form of the liver-fluke."

With respect to the growth of the fluke of sheep, Prof. Thomas says:—"It appears probable that at least six weeks elapse, from the time the fluke is swallowed by the sheep, before the parasite becomes adult and begins to produce eggs." With respect to the length of time during which the flukes remain alive within the sheep, Prof. Thomas does not appear to have any definite information; he thinks, however, that they may remain for a longer period than a year. I am satisfied, however, from information which I obtained from W. H. Hockly, Esq., M.L.A., Cullendale, Bedford, S.A., that the flukes

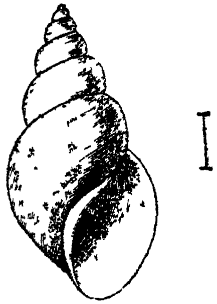


Fig. 16. The Snail, *Limnæus truncatulus*, which serves as the host of the sporocyst, redia, and growing cercaria, of the liver fluke. Magnified (THOMAS).

Fig. 17. Snail, natural size.

remain alive for a much longer period than that. Mr. Hockly bought a number of sheep some time in 1877; these sheep were discovered afterwards to be affected with fluke, the flukes being found in the liver of every sheep that was killed. Mr. Hockly has farmed with sheep and goats on Cullendale for a number of years, but during the whole of that time he never saw a single fluke in the liver of any of the sheep which were bred and reared on the place. Neither did the disease make its appearance amongst his other flock, either during the time that these affected sheep were amongst them or since. There are no vleys or marshy places on the grazing part of his farm where the snails could live, and we have seen that these are the necessary intermediate hosts. But although Mr. Hockly kept the flock of fluky sheep until they had either been slaughtered off or had died from old age, in the liver of every one that was examined after death, during the whole of that time, about four years, he found a greater or less number of flukes. In the early part of 1881, when I visited Mr. Hockly's farm, he immediately sent for two old ewes, almost the only ones remaining of that flock, and had them killed for my inspection. I carefully examined the livers of these sheep, and found four full-sized flukes in the liver-ducts of one, and five in the liver-ducts of the other. These flukes were alive and normal in appearance in every respect. Since that time the results of my observations respecting this matter have tended to confirm the opinion that the fluke remains alive in the liver of the sheep very much longer than one year.

From the above extracts which I have taken from Prof. Thomas's important and extremely interesting paper respecting the life-history of this liver-fluke, it will readily be understood how this disease is propagated, and why it is confined to certain districts or localities. The conditions which are necessary for the propagation of this parasite are:—1st, Fluke eggs must be introduced either by some affected animals which will distribute them in their droppings, or be washed to that part during a flood; 2nd, there must be fresh-water vleys, marshy ground, or shallow streams, during the summer months, or the snails, which are necessary as the intermediate hosts of these parasites, cannot live; prolonged drought kills them. This is the reason why you may take sheep rotten with fluke on to dry farms in so many districts of this Colony, and yet these farms will never become tainted. It is necessary also that the water in these vleys, mountain-streams, or marshy places should be *fresh* water; neither the eggs nor the snails can live in salt (brak) water.

Prof. Thomas says that "it is necessary that a particular snail called *Limnœus truncatulus* be present," but he qualifies that statement by a note. He says:—" The snail *L. truncatulus* has a very wide distribution, being found, according to Dr. Gwyn-Jeffreys, throughout Europe, in North Asia, Morocco, Algeria, Madeira and (doubtfully) Guatemala. The liver-fluke, however, has a much wider distribution, and it follows that there must be in certain countries, supposing *L. truncatulus* to be really absent, another snail which can replace it as a host. Thus the fluke is found in the United States, where *L. truncatulus* is said not to occur, though several other kinds of snails belonging to the genus Limnæus are found. In Australia the fluke occurs both in the sheep and in human beings. *L. truncatulus* is stated not to exist there, but eleven kinds of Limnæi are recorded. It is probable that in both these countries some other species of Limnæus serves as a host." It is equally probable that the *Limnæus truncatulus* 'does not exist in South Africa. But, be that as it may, it is perfectly clear that some such intermediate host does exist, because the disease can be propagated through such a medium only.

But the questions of most importance to the colonial farmer are:—How is this fluke disease to be prevented? and, how can it be cured after it has appeared? With respect to the latter question: There is no known cure for this disease, and the chances are very great against our ever being able to find one. The flukes inhabit the liver of the affected animal, and as medicines can reach that organ through the blood only, it is very difficult to conceive of a remedy which will destroy the flukes without injuring the animal itself; although in these days of experiment and research, scarcely anything appears impossible. It is found, at present, that some substances can be injected into the torrent of the circulation, in larger quantities than can be safely administered in other ways. We know of nothing at present, however, which will clear the liver of these parasites. A great deal may be done, however, to prevent the stock from becoming affected, and to exercise a modifying effect upon the disease after it has appeared in a flock.

With respect to prevention: As the disease is contracted by the stock by grazing on these marshy places only, such as the sides of vleys, the moist edges of shallow mountain-streams, &c., or by drinking the water from the vleys, &c., the only certain means of prevention would be to keep the stock away from these tainted localities, or at any rate to keep them away during the time when they are most likely to pick up the larvæ of the fluke.

Respecting the time of the year when such pasture becomes most dangerous, Prof. Thomas says:—"The snail buries itself in mud or soil in the winter time and, owing to the cold, no embryos are hatched out at that time. If the weather be warm in April, it is possible that a few may be hatched out towards the end of the month, but they will not be numerous. In May, however, greater numbers will be hatched, and still more in June and July. These two months are the time of the year when the snails are most liable to be infected. . . . . Even under the most favourable circumstances, it will be seven weeks before the cercariæ are formed within the snail so as to be ready for transference to the sheep. Animals may take the rot as early as June, but this is not of frequent occurrence. . . . . In July and August, relatively more will be found, but it is in the months of September and October that they are most numerous; these are the most dangerous months." These remarks, of course, apply to England, but they may serve as a guide to us in taking precautionary measures in South Africa.

It is somewhat fortunate that the localities in this colony where the fluke is most prevalent are situated at a considerable elevation above sea-level, where the cold is very severe for about six months of the year, viz., from April to September inclusive.

In those districts of the colony, therefore, the month of October would exactly correspond with the month of April in England in every respect, modified, of course, by that condition which modifies all our calculations here, having a reference to either pastoral or agricultural pursuits, viz., the time when the spring rains come. For practical purposes, however, it may be stated that the months of January, February, March and April are the most dangerous months of the year in which to graze stock upon these vleys and marshy places where the fluke is liable to be contracted by them.

If it is impracticable to prevent stock from grazing on such places during these months, or, if they could be kept from grazing, there are no other places for them to drink; then measures must be adopted to destroy the cysts of the fluke, either on the ground or as they are taken up by the stock, and so prevent them from arriving at maturity within the animal. With reference to this point, Prof. Thomas found that a weak solution of common salt in water (containing only ¼ per cent. of salt) proves fatal to this particular snail, as it does to the embryos, sporocysts, redia, cercaria, and cysts. It has long been known that sheep which graze on salt marshes enjoy an entire immunity from fluke, and that even flocks which are affected with fluke on being turned on to these marshes recover their condition, even if they are not completely cleared of the fluke.

Now on most farms and sheep runs where fluke prevails in this colony, the stock, as a rule, will eat salt freely. Every farmer who grazes small stock on such an infected farm, should therefore, keep a constant supply of common salt, near to the borders of the infected areas, so that the sheep or goats should obtain a *daily* allowance which would act upon the cysts that they swallow daily while grazing. In this matter, if a farmer attempts to use salt as a preventive of fluke, he must do it—*thoroughly* and *continually*, or he will simply waste his money, and fail to prevent the development of the disease. If the salt is omitted for even a very limited time, the cysts taken in during that interval would be liable to pass uninjured from the stomach to the liver, and the animals become *smitten* as it is called.

The following lick is highly spoken of as a preventative of fluke and other internal parasites:—

Common Salt	6 parts.
Powdered Slaked Lime	1 part.
Sulphur	1 ,,
Sulphate of Iron	1 ,,

Mix thoroughly and keep continually before the stock.

Mr. Henry Thompson, M.R.C.V.S., of Aspatria Agricultural College, England, in his pamphlet (1882) on fluke records numerous instances in which "fluke-infested pasture was rendered completely sound by applying 5 to 8 cwt. of rough ground rock-salt to the acre of the suspected pasture." The common rough salt obtained from the salt pans of the colony would act equally well, if it were spread over such pastures in sufficient quantity during the months of September, October, and November. And considering that on many farms the tainted area is very small, it would pay a farmer well to destroy the snails by a dressing of salt.

But there are more effectual methods of destroying these snails and fluke embryos than by sowing salt on the infected ground or by giving common salt, lime &c., to the sheep to lick. On most farms and sheep runs where fluke is prevalent, the contaminated areas might be satisfactorily dealt with at comparatively little cost by draining. Snails cannot live without moisture. Prof. Thomas says:—" When the droppings containing fluke eggs fall on to a field, the rain will distribute the eggs over the surface, washing them down to the roots of the grass. If the soil is light and sandy or porous, the ground will be sound, for the water will filter into the earth, leaving the eggs on the surface, where they will get dried and so be destroyed. If on the other hand, the soil is heavy and clayey, so that the rain water does not sink into the earth, but flows along the surface, the ground is *rotting*. For as the water flows over the surface, it carries the fluke eggs along with it, and deposits them in ditches, holes, marshy places, furrows where the water stands; all of them places where the eggs will hatch. The obvious remedy for this evil is to drain the land thoroughly."

How many farms are there on the Bontebok Flats, the Stormberg and Sneeuwberg ranges of mountains, and similar localities, where sheep die annually by the thousand from fluke, which could be made perfectly healthy by a little surface draining, preventing the water arising from springs, &c., from spreading all over the veld, or remaining stagnant in hollows, vleys &c. Because, as will be learned from the previous remarks, it is amongst the moist grass at and near the edges of such streams, where the snails are more particularly found, and where the process of hatching the fluke eggs is principally carried on; and further the cyst, or final stage of the fluke-embryo, which the sheep picks up, attaches itself to the roots of these grasses, and remains there until eaten along with the grass. It will be readily seen, therefore, where the principal source of mischief lies. and also how the remedy is to be applied with most hopes of success.

In an undulating country, like most of the sour veld Mountain regions of this Colony, I have seen many vleys and marshy places completely dried, by skilfully drawing several furrows with a plough through them. Each rain-storm cuts these furrows deeper until they become perfect sluits drying up the vley completely. There are many of these marshy places, which at present are permitted to ruin the small stock on an otherwise good farm that could easily be drained, and at very small cost, if a little thought and skill were applied to it. But if a tainted vley, or marshy area cannot be properly drained, it should be fenced in, and stock, especially small stock, should be prevented from grazing on it, except during the winter months. If it is grass which grows on the vley or marsh, it could be made into hay, and given to the stock when most needed. With respect to the water usually supplied to stock, there can be little doubt that dam water, containing as it does the washed in excrementitious matter, deposited by the stock on the surface of the veld, in addition to the amount daily deposited by them when they come to drink, must become the breeding place of a large number of animal parasites, and one of the principal sources of infection. I anticipate, therefore, that the stock farmers will gradually awake to the advantage of using spring or well-water for stock, in preference to surface water from the dam, and where the latter has to be used, that the dam will be enclosed, and the water led out into troughs to prevent contamination as much as possible. In like manner, they will realize that a vley or marsh, however valuable it may appear to be from the feeding point of view, it is feeding ground which is ruinous in its effects unless properly utilized.

Curative Treatment of Fluke.

With respect to sheep which are affected with fluke: I have already said that there is no known cure, but a judicious treatment, and a change to clean unaffected veld, may save a considerable number of those affected. Every class of animal, great or small, has what may be termed its average duration of life, and experience has shown, that the average duration of life of these flukes is from two to three years, many, however, die within that period, and some few live beyond it. If therefore, infected sheep can be removed to clean good veld at once, those severely smitten will die off early, while the others will gradually recover, as no additions are made to the number of the flukes in the liver after the removal of the stock from the tainted ground. Good nourishing pasture, if it can be obtained, is one of the most efficient aids to the recovery of the affected animals, and the removal of the dropsy which is invariably associated with severe fluke infestation. Tonics and diuretics will also materially assist the vital powers of the system to rid itself of the excessive quantity of serous fluid which is present. But medicine is comparatively valueless, unless it is combined with good food.

The following mixture has been largely recommended :—

Raw linseed oil	1 gallon.
Oil of turpentine	2 quarts.
Powdered saltpetre	1 pound.
Powdered sulphate of iron ...	1 pound.

Mix and give a tablespoonful daily for three days, then every second day for a week, then twice a week. At the same time allow the sheep to lick as much common salt as they can be induced to take, and if they will not lick it voluntarily, they should be given a full teaspoonful daily. It does good in several ways, it acts as a stimulant to the processes of digestion and assimilation, and by its ready solution and free entrance into the blood, it will supply the amount of soda which is required for the secretion of bile. It also contributes with other saline and albuminous matters to preserve the proper specific gravity of the liquor sanguinis of the blood which ought to be equivalent to that of the contents of the red corpuscles, as it is only in this condition that the formation of the latter can duly take place.

SYMPTOMS.

The general appearance of sheep when suffering from fluke in the liver, differs but little from the unthrifty and emaciated condition of sheep which are infested with large numbers of other internal parasites such as the *strongylus contortus*—or wire worm, found in the fourth stomach, and tape worms, and round worms which infest the intestines. One of the most characteristic symptoms of fluke in the liver, when the animal is seriously affected, is a dropsical condition of the cavities and tissues of the body. This is indicated by the appearance of a dropsical swelling, or bag, which forms under the skin, and hangs down from the throat and between the branches of the lower jaw. This is called "dikkop" by the Dutch farmers. This dropsical bag-like swelling is more pronounced in sheep that are affected with fluke in the liver, than it is in any other form of poverty and emaciation arising from the presence of other internal parasites or any other debilitating cause.

It will be observed also that the contents of this dropsical bag, increases considerably during the day when the sheep's head is held down in the act of grazing, and it correspondingly decreases towards morning, owing to the sheep lying down during the night with its head held up while ruminating. This is easily understood, because the contents of this bag consist of a clear watery serum, which gravitates towards the head from the chest during the day, and drains back again to the chest during the night, being assisted considerably by the movements of the lower jaw in the act of

The first effect of the invasion of the bile ducts by young flukes, is a tendency to fatten very rapidly. This is believed to be due to the stimulating action of the young flukes on the bile ducts, increasing the biliary secretion, and promoting the assimilation of the food. This period is usually very brief, however, if a large number of flukes have invaded the bile ducts. Because, as they increase in size they irritate and distend the ducts, and cause considerable thickening of the fibrous covering of the walls. This irritation gradually extends to the liver substance adjoining the affected bile ducts, and causes congestion and a slow form of inflammatory action, which gives rise to an increase in the fibrous framework of the liver, which presses upon, and largely replaces the liver cells, and correspondingly impairs their secreting function.

It is this destruction of the liver cells, and the consequent impairment of their secreting function, that leads to the serious interruption of the processes of digestion, assimilation, and the healthy functions of the organs of the body generally, which is indicated by the rapid manner in which the affected animal falls off in condition. The sheep looks dull, the eyes lose their brightness, the conjunctiva becomes pale, presenting a puffy watery appearance. The wool is dry and harsh, and is clapped close to the body, and is easily pulled out; there is rapid emaciation, and a general anæmic and dropsical condition. The back bone becomes sharp and prominent—"razor-backed"—and the abdomen becomes pendulous; diarrhœa sets in, followed by exhaustion and death. The rapidity with which these symptoms become developed will depend much upon the number of flukes which have invaded the liver, and the local conditions, such as the character of the weather, and the quality of the veld. If the weather is bleak and cold, and the veld dry and innutritious, these symptoms will follow each other in rapid succession. If on the contrary the veld is good, and the other conditions are favourable they will develop more gradually.

POST MORTEM APPEARANCES.

The pathological lesions present in a case of fluke will largely depend upon the extent of infection, and the length of time that the flukes have existed in the liver. In the earlier stages there is little marked change visible, the liver is enlarged and slightly uneven, with hard cyrrhotic patches, and bluish white streaks on its surface. There is slight distension of the bile ducts with flukes. In more advanced cases the liver becomes hard and irregularly knotted or corrugated, the bile ducts become greatly enlarged, and their walls much thickened and hardened, and their lumen distended with flukes crowded together. (*Vide* coloured plate). In very advanced cases, the true cellular structure of the liver is largely displaced by the thickened fibrous tissue which forms the external coat of the bile ducts and of the blood vessels, and also constitutes the minute frame work of the liver. The liver is greatly altered in shape, and considerably diminished in size, and so hard that it cuts like cartilage, conveying a crisp gritty sensation to the knife.

In cases of long standing in which the animal has survived the acute effects of the flukes, the larger bile ducts stand out like solid fibrous cords; most of the flukes having escaped, and the lumen of the ducts become filled with fibrous tissue.

The general lesions are:—the muscular tissue of the body is softer and paler in colour than natural, and in advanced cases it is flabby and watery looking. The abdominal cavity contains a variable quantity of a clear watery serum, and the abdominal organs also present a blanched and watery appearance. In fact the whole of the fat and cellular tissue throughout the body is infiltrated with serous fluid. The chest and heart-bag also contain a variable quantity of a similar fluid, often mistaken for heart water. The flesh does not stiffen after being slaughtered and dressed.

ANALYSIS OF FERTILISER.

The following is transmitted by the Senior Analyst, Mr. Chas F. Juritz:—

Copy of Report on the analysis of a sample of Superphosphate, purchased from Messrs. Hayward, Young & Co. of Port Elizabeth.

The following are the analytical results:—

Lime	23.87	per cent.
Phosphoric oxide, Total	15.16	,,
Phosphoric oxide, Soluble in water ...	14.70	,,
Phosphoric oxide, Soluble in Citrate solution	15.11	,,

The value of this sample per ton of 2,000 lbs. calculated from the usual unit values of the different constituents, is as follows:—

Lime	£0	19	11
Phosphoric oxide, Soluble in water ...	4	5	9
Phosphoric oxide, Soluble in Citrate solution ...	0	2	3
Phosphoric oxide, Insoluble	0	0	3
	£5	8	1

A. J. J. B. SIMONS, Analyst.

GROWING LUCERNE WITH FLOOD WATER.

At recent meeting of the Cradock Farmers' Association Mr. H. J. Collett, contributed the following interesting and practical paper on Growing Lucerne with Flood Water:—

I shall endeavour to put before you in my paper practically what I have experienced in my small way in irrigating from the Brak and Fish Rivers. These two rivers as some of you are aware, are almost perennial streams in good seasons, but owing to successive droughts and want of the good old south-east steady rain and the winter snow, have been reduced to periodical streams in every sense of the word.

Taking the last two years we may safely say they are the driest on record so far as permanency of water in either fountain or river goes. Nevertheless you get a river farm and

YOU HAVE A GOLD MINE

if you only know how to develop it.

Being in possession of a river farm the first consideration is where and how to build a weir. The most important point is to select a good hard rock foundation with a view to gradients and to securing the ends of the weir to prevent the water getting round in time of flood. Between two kopjes or hills would be an ideal spot. Making the wall or weir as long as possible to give free passage to flood water and prevent its rising to unnecessary height.

Next to be considered is the construction and

COST OF BUILDING THE WEIR

Now I have three weirs in the two rivers. The first one from three to four feet high, built on solid rock with cement and lime and good stone. This one I am sorry to say has broken twice with flood water and timber rushing over it. Two other weirs from four to nine feet high on solid rock are built with loose stone well packed, and each stone a header and sloping towards the up-stream with the wall quite perpendicular on the down stream side, afterwards making it water tight on the inside or up stream side by building say a two feet wall with cement and stone against it and coping the top with long stones sloping towards the up stream well bedded in cement or concrete, and filled in between with good cement and clean sand one to four feet. Only good picked long and strong stones should be used for the coping. Needless to say these two dams were built at half the cost of the other and have not shifted. Of course wing walls should be carried up at the ends of the weir to prevent floods getting into the furrow. These should be built almost at right-angles to the weir on the up stream side, into which slide doors are built varying in size to quantity of water required. It is also very essential to have a small outlet in the end of the weir or immediately in front of the sluice gate to take away the mud when the river is in flood.

NEXT THE FURROW,

starting from the river, should be at least two feet lower than the top of the dam varying in width according to the extent of ground to be irrigated, and with a gradient of one and a half to two inches per hundred yards. Make the furrow with the ordinary size drag dam scoop drawn by four or six oxen, placing the ground say five yards away from the banks and using a strong plough. Even if the furrow is gravel or deep, plough it in preference to using the pick axe which is a slow and expensive operation.

To keep the furrow free from silt to a great extent, I should recommend all outlets to be built a foot below the bed of the furrow to allow the water to rush out with force and carry the silt while still in a semi-liquid form out of the main. Build these outlets wherever convenient with slide doors, and if opened in succesion only for a few minutes each, would serve the double purpose of taking out sand and saving the furrow from overflooding and damage in breakage.

Proceeding from the main,

DISTRIBUTORY OR SMALLER FURROWS

are necessary to divert the water in different directions and afterwards into plough furrows to conveniently wet the ground all over thoroughly for ploughing and if it is new ground intended for the cultivation of lucerne, put up your outside fences and leave partition fences until you have levelled and ploughed the whole, with a view to dividing it afterwards into fields of not more than eight to ten acres

PREPARING THE GROUND.

After the first ploughing, of course, the bush will be under if you use the Canton plough which I can strongly recommend. Leave the soil in this way until the bush is dead, then harrow with iron harrow raking the bush in rows in this way, that might still be on the top and burn it. Don't sow lucerne the first year, but sow other crops such as oats, wheat or mealies, wet the ground and use the Canton disc harrow for sowing, don't plough or you will get all the bush on the top again.

The advantage gained in not sowing lucerne first is that you can work the soil better after this first crop and find out which way the water will run more conveniently and to further destroy the roots of bush.

After reaping this first crop, if successful, graze the land and clear off all stubble with stock; proceed to wet it again and plough, and unless a hill-side plough is used which is not a desirable implement to use on new soil, you will now have hollow furrows, which by using a land leveller or 15 feet beam across these furrows you will close them and take off any other lumps that might still be on the ground. If the beam is used tie one end longer than the other. After levelling put the disc on again to pulverise the soil then draw straight furrows on the side of the intended field for distributing water and marking out the field. If the ground is sloping draw more furrows about twelve yards apart, but in such a way that they do not wash deeper. These are only required for first waterings to prevent soil washing into sluits after the ground is covered with growth, a strong water can be put at the side and allowed to run right through the field, when these temporary furrows will be washed shut and with harrowing, after first crop, will not be seen.

If the ground is very level, I would recommend small ridges to be ploughed up in such a way that you have a small furrow on each side of the ridge and hence one on each side of the bed, these would be useful for first watering and the land being level they will soon grow shut when you will only have a small ridge, on the sides of the bed and the mower can work between these. The first watering should be done lightly and not with a strong water or seed and soil will be taken away.

I am opposed to beds made by the triangle as they are too close together and numerous to run the mower over or between.

Going back to

THE SOWING OF THE SEED,

your furrows and ridges are now ploughed, proceed to sow the lucerne seed broadcast by hand or machine about ten or twelve pounds to the acre, harrow lightly (bush or chain harrow preferable) one horse would do this, and a light rolling would also be advantageous. The ground still being wet presuming it is July, August or September, April or May which are all good months to sow in this way, being cool the ground does not dry before the seed has time to come up.

Sowing in the hotter months, the ground must be prepared, and either sown before a rain or before watering, and even then the ground crusts hard before the seed can come up, in which case water twice within the week.

Two rains in succession would be just the thing, but seems out of the question now-a-days. After two months if you find the seed has not come up well, light harrow and sow again, or if a lot of weeds spring up, mow the field and then sow and harrow.

Stock should not be put on young lucerne for at least six months.

There is a good deal of chance work in establishing a young crop, which entirely depends on the getting up of the seed in the first place, dependent on the state of the soil and the weather.

WHEN TO SOW.

Hitherto I have advocated sowing in the autumn, but owing to the caterpillar, late sowing was a complete failure last year, and I am inclined to think that the early spring and even July would be better. The young plant would be well established before the caterpillar invasion, which is always worst in autumn. Don't wait for the first crop after the winter to flower, but as an exception to the rule, cut it as soon as long enough, for it takes a long time to flower, and you lose time.

SOME USEFUL HINTS.

Avoid putting stock on to wet lands, rather feed them in wet weather than allow them to graze.

Harrow the fields whenever opportunity offers, and resow occasionally if you cannot afford to let it go to seed.

Going back again to the distributing furrows, which are so arranged as to get the water on to every point of the different fields, divert the water from one to the other by means of the cheapest and easiest method. I have found by knocking the bottom out of an empty cement cask, laying it in the furrow and putting a three inch casing of cement, one to seven of clean sand well round it, putting a piece of sheet iron or board in front while still wet makes a cheap and effective method of diverting the water. In smaller places large sheep-dip tins with the bottom out and cased in cement could also be made use of, and an old iron tank cut up makes good stoppers for these. By having a number of these sluices all over the fields you gain entire control of the water, even if very strong.

If you find a furrow washing deep put a few loads of hard kraal manure into it, which will encourage grass to grow, and stop the breaking away.

Dodder in lucerne is not difficult to eradicate, provided you don't let it go too far and go to seed, burning with brushwood is effectual. The man on the mower is the best one to detect a spot in the field; it has a yellow appearance. If allowed to increase it becomes a dangerous enemy.

Silt is not detrimental to lucerne provided it is not too thick, and if there is a danger of it doing harm, use the harrow at once.

I believe the disc harrow is good on old lucerne, but I am of opinion that we have not got the right implement yet, something in the shape of a spiked roller to dig the field which would be light in draught and effectual, perhaps someone will invent such an implement.

Inside fences should have a barbed wire about three feet from the ground to prevent cattle pushing their heads through the fence to feed on the other side. The fence should have at least seven wires and not less than five feet three inches high or valuable horses or birds get damaged in trying to jump a low fence.

As to the

ADVANTAGES OF GROWING LUCERNE.

over other crops I can only refer you to the market prices of say Johannesburg, where at the present time oat hay is selling at 8s and 8s 6d per 100 lbs and lucerne hay from 9s to 10s. Also bear in mind that lucerne is a surer crop and is cut six times a year when oats is only cut once.

GRAVITATION *vs* MACHINERY

With this opportunity gentlemen let me impress on all who have a river to get the water out by gravitation and not by machinery, even though it may look a big job it will pay you and by using a lot of water when it is plentiful you are not only benefiting yourself. but also your lower neighbour and the country in general, which is becoming dryer and dryer by drainage of sluits and boring. Let us seek to keep the water on the soil and not let it run off in flooding torrents to the sea. Let those who have not the facility of the river supply make large dams to store up water for irrigation and grow lucerne to assist nature through the drought period. We have good soil, good markets and an enormous extent for practical work.

Irrigation in Other Countries.

We are told there are 25 million acres irrigated in India, 6 million acres in Egypt, 8 millions in Italy, 800 thousand in Spain, 400 thousand in France, and 4 millions in the United States, this means that 40 million acres are cultivated which but for irrigation would be barren and unproductive. In addition to this there are millions of acres cultivated by irrigation in China, Japan, Australia, Algeria and South America, saying nothing of South Africa where irrigation works would furnish homes for hundreds of families, good agriculturists who at the present time are rendered destitute, and one of the greatest advantages of such work is that it becomes an insurance on the crops."

The Paper Discussed.

Mr. Wallis proposed a vote of thanks to Mr. Collett for his paper, which would, he was sure, be useful to other members as to himself.

Mr. A. Hennings seconded. He did not see anything in the paper which he could not endorse.

Mr. Antrobus inquired as to re-sowing lands, as referred to in the paper.

Mr. Collett said it was cheaper to resow, where necessary, than to allow a cutting to go to seed.

Mr. Christian remarked on the difficulty of establishing lucerne on brak ground.

Mr. Collett thought when ground was very brak it was better to grow grass which would grow almost without irrigation as the roots were more on the surface, but lucerne needed more water on brak ground than did grass.

Mr. Hougham Abrahamson enquired whether Mr. Collett would advise the sowing of other crops with lucerne when sowing lucerne—say mealies, and would he sow such in drills.

Mr. Collett replied he would sow late mealies and sow the lucerne just after the mealies were up—the mealies would not then give too much shade and could be cut as fodder when the lucerne was well up.

Mr. du Plessis wanted to know why it was necessary to resow, and was informed that the tramping of stock killed some plants—if the lucerne, was always cut without stock eating it off, it would remain thick.

Mr. du Plessis sought advice about harrowing—did it not damage the lucerne?

Mr. Collett said harrowing helped a lot—lucerne was not a wild plant, and needed cultivation—the more the better—it would degenerate if it ran wild.

Mr. Hennings enquired was it advisable to give lots of water.

Mr. Collett found the water must not stand on lucerne or the plants would die.

Mr. Hennings said that was just what he found, but if lucerne had roots twenty feet deep, it would take a long time for the water to reach so far. Would twenty-four hours watering kill?

Mr. Collett explained that the water must be running, it was standing water that smothered the plants, and if it were muddy water it would smother more quickly—the roots then rotted at the top—clean water ran away more quickly than muddy water.

Mr. Scott inquired if brak water was bad, and was advised that most of the water we get was good and not too brak.

Mr. Verster thought young lucerne a year old was more likely to die than if, say, five years old.

Mr. Hennings said in the case he was speaking of, the lucerne was five years old, and where the water stood in the hollows for 24 hours the lucerne died—that was muddy water.

Mr. Abrahamson, referring to the writer's remark about harrowing, said, he understood a gentleman in Graaff Reinet had recently invented such an implement as was desired.

Mr. Collett replied he was glad to note that Mr. Kingwell was on the track. Nine years ago he had written to a Bay firm explaining what was wanted and recommending them to design such an instrument.

Mr. Pietersen: Could any kind of stock run on lucerne without danger?

Mr. Collett said it was good for ostriches, horses, pigs and sheep, but cattle should not stay in it more than twenty minutes—after that they should be turned out.

Mr. Hennings wanted to know if it was good to turn stock on lucerne in August and September—would the stock not eat it off dead? He was advised not to allow the stock to eat down so as to damage the crown.

Mr. Pietersen enquired if imported seed was as good as colonial, the reply being that the farmer must be particular to get only good seed; dodder seed, was a little smaller than lucerne seed, and good imported seed could be got that was guaranteed clean of dodder, the cleaning being done by special machinery.

Mr. Hennings asked whether the method of destroying dodder by burning did not also kill the lucerne, and was told even if it did that was nothing, it was easy to resow—the great thing was to tackle dodder in time.

Mr. du Plessis wanted to know where the dodder came from—he found some in a land after it had been sown three or four years.

Mr. Collett thought it first came with the lucerne seed but then went to seed and spread before it was noticed—his advice was to look out for it and when found not to attempt to remove it but place dry grass or bushes on it and burn it where it was growing.

Mr. Abrahamson had heard that sulphate of lime mixed with water and sprinkled over the dodder killed it, but whilst also killing the lucerne into the ground, did not destroy the latter, which came up again.

Mr. Collett thought they might well discuss dodder at another meeting. He believed there was a lot of it in the trees on the veld.

Mr. O. Cawood said if dodder was in the veld it would be spread on to the lands by irrigation, and they should make an effort to get rid of it before lucerne was taken up by farmers so much—it would be more difficult later on.

Mr. J. Butler suggested that Mr. Cawood should send a specimen of the dodder from the veld to Professsor MacOwan to decide whether it was identical with the dodder that was so fatal to lucerne. —*Midland News.*

WESTERN PROVINCE HORTICULTURAL BOARD.

The quarterly meeting of the Western Province Horticultural Board was held on Friday, December 2nd, in the Western Province Agricultural Society's offices, Atkinson's Chambers, St. George's Street. The Hon. C. W. H. Kohler presided, and there were also present: Messrs. P. R. Malleson, W. van der Byl, C. Heatlie, H. Meyer, P. J. Marius, Smith, Lounsbury (Government Entomologist), P. J. le Roux, with the Secretary, Mr. C. Mayer.

RAILWAY TARIFFS.

In reference to the excessive railway charges for the conveyance of fruit, Mr. P. R. Malleson said that they were all well aware of the fact that they interviewed Dr. Smartt on the question of increased rates on fruit, and he was sorry to say that they had practically got no satisfaction whatever. Dr. Smartt talked a great deal about the hard times. He said the fruit traffic was not paying the Government, but he (Dr. Smartt) was not able to give any satisfactory reason for the increased rates on fruit. He (Mr. Malleson) thought they ought to move a resolution so that the matter be brought again before the notice of the Government. The question was very serious indeed, and affected vitally the fruit traffic of the country. In East London he saw for himself that if it were not for the Western Province fruit there would be none at all in that part of the country. Dr. Smartt promised that he would endeavour to make a reduction in the rates of fruit to East London and Port Elizabeth, if fruit were carried in cattle trucks and nothing but full trucks were sent. Since then, however, nothing had been heard of the matter. If the Vigilance Committee were going to interview Dr. Smartt on the question of boxes, they ought to interview him on this matter also. He (Mr. Malleson) had heard unofficially that the rates on C.S A.R. were being dropped.

The Chairman: Dr. Smartt said they were carrying fruit at one time at ½d. per ton per mile, now it was ¾d. and the cost to the Government was seven-eighths of a penny. The Government had made experiments, and they found that that they could not make a reduction in view of the fact that the railways were not paying. Dr. Smartt, however, held out a hope that as soon as the Government were in a positian to do so they would consider the whole question. Mr. Kohler concluded by stating that on the American railways, fruit could be carried at one-third of a penny per mile at a profit and in America wages were higher than in South Africa.

The matter was referred back to the Vigilance Committee, with a view to a further interview with Dr. Smartt.

Mr. H. Meyer stated that he had made application to the Railway Department asking for reasons why the department refused to carry imported cases in shooks at the rate of empty boxes, simply because they were in shooks instead of being nailed together in cases. They were paying now at timber rate, and they contended that they should pay under clause 182 of the tariff-book as empties sent to be filled.

A letter received from the Assistant Traffic Manager read as follows: "In reply to your letter of the 6th inst., regarding the rate for fruit boxes, I have the honour to state that provided a declaration is handed in at the time to the effect that empty fruit boxes will be returned filled, they will be conveyed at one-half the 2d. rate."

VITICULTURAL EXPERIMENT STATION.

The Under Secretary for Agriculture in reply to a letter from the Board urging the establishment of a Viticultural Experiment Station, said he was thoroughly in accord with the idea, and as soon as the financial position would permit, he would take steps in that direction.

COLONIAL FRUITS EXHIBITION.

In reference to the proposed exhibition of Colonial-grown fruits in London, the Under Secretary for Agriculture wrote that the Royal Horticultural Society had decided to hold a second exhibition of Colonial fruits in the beginning of April next, or at the end of March, the date to be fixed later, at which time the Colony should take steps to participate.

It was decided that the Board should take the matter up.

SPECIAL ARTICLES.

Mr. Malleson reported that he had promised to contribute articles to the Royal Horticultural Society's journal (England) on Cape fruit-growing. It had been a rash promise, and he wished other members of the Board to support him. Eventually, a committee, consisting of Messrs. P. J. Cillie, Malleson, and Mayer, was appointed to draft, consider, and finally pass such articles.

PROTECTIVE DUTIES.

A further letter was read from the Secretary of Agriculture, stating that it was impossible to make any alteration in the tariff, and that the time had not arrived for the imposition of a protective duty.

Mr. Van der Byl: Are we to understand that we are to remain open as a dumping-ground for any overstocked market? There are 40,000 cases of fruit that might be grown in the Colony imported yearly.

The Chairman said he did not think the Minister of Agriculture had grasped the fact of the market being flooded with imported fruit. He moved that the business be referred back to the Vigilance Committee, with a view to a further interview with Mr. Fuller. He did not think that the Secretary for Agriculture realised the danger.

Mr. Lounsbury asked if anything could be done in the face of the Customs Convention. Would not the permission of the other colonies be required before any change in the tariff could be effected?

Mr. Meyer pointed out that the necessary change could be effected with the consent of the other signatories to the Convention.

This matter also was referred to the Vigilance Committee, so that it should be brought more forcibly under the notice of the Government.

A GOVERNMENT MYCOLOGIST.

A letter was read from the Paarl Farmers' Association, urging the necessity for approaching the Government, *re* the appointment of a mycologist. Mr. Malleson said that this was absolutely essential. The Eastern Board was as strongly in favour of the appointment as the Western, but he did not think that the financial position would warrant the appointment at present. It could, however, be brought under the notice of the Government.

Mr. H. Meyer asked if a mycologist would have been a help during the recent scare?

Mr. Lounsbury: No, he could not have discovered anything, because there was nothing to discover.

Several members pointed out that the Government would attend to this matter as soon the finances would permit.

The meeting considered also the clauses of the proposed Local Option Bill to check the spread of plant pests and diseases of orchards, gardens &c., drafted by the committee of the Western Province Board of Horticulture.

SPECIAL MEETING.

A special meeting of the Western Province Horticultural Board was held on Friday, December 17th when there were present: The Hon. C. W. H. Kohler, M.L.C., who presided, and Messrs. J. X. Merriman, M.L.A., H. Meyers (Paarl), W. van der Byl (Stellenbosch), R. J. Bulmer (Paarl), P. R. Malleson (Worcester), H. Cloete, M.L.A., (Constantia), C. P. Lounsbury (Government Entomologist), D. de Wet (Robertson) Chas. Heatlie (Worcester), and the secretary (Mr. C. Mayer). The meeting was called primarily to consider the remaining clauses in the Insect Pest Bill and Co-perative Wineries.

Mr. Merriman said he hoped nothing would be allowed to interfere with Mr. Lounsbury being sent to Brazil to procure the parasites of the fruit fly. This was absolutely necessary for the fruit industry. The experiment was worth spending money on to get rid of these parasites.

EAST AND WEST

Mr. Malleson proposed that the Eastern and Western Province Horticultural Boards should hold their meetings at the same time, as they had one common chairman, namely, the Secretary for Agriculture. Of course, each Board would pay their own expenses The Eastern Province Board had already agreed to hold their Congress at the same time as the Western Province.

The Chairman: It has been suggested that the Congress be held on the 16th, 17th, and 18th May next. He thought it would be best also to give each association early information of the date of Congress.

Mr. Merriman: These congresses are most successful in America. Some States sent 400 delegates, and some sent very much less. He thought they should not restrict members coming to Congress.

Mr. Cloete proposed that at the Congress each association would have two votes, and of course any other members that liked could attend.

Mr. Malleson suggested that a proper agenda paper be drawn out, and that each member only speak ten minutes.

Mr. W. van der Byl thought they ought to have a small committee to deal with the matter.

This was agred to.

Mr. Merriman (sotto voce): The fruit trade was a thing they ought to go into very fully.

Mr. Lounsbury: In America the chief end was discussion of horticultural subjects; here it was the passing of resolutions to forward to the Government.

Mr. Merriman. That is the curse of this country. Everyone wanted the Government to help them. They were like a lot of little dogs looking for sops.

THE INSECT PESTS BILL.

It was decided to request Mr. H. Cloete, M.L.A., to take charge of the Insect Posts Bill and push it through next session. Mr. Cloete accepted this responsibility.

THE EASTERN PROVINCE AND CODLIN MOTH.

A communication was read from the Eastern Province Horticultural Board as follows: Resolved that the line of demarcration suggested by the Government viz.: East of the Midland Railway line from Zwartkops, northwards on to Norval's Point, including stations on the Midland line from Zwartkops to Rosmead, be adopted by Congress, and the Department be written to to that effect, and that in an area thus defined no apples, pears, or quinces be allowed to pass either by sea or land.

Communications were also read from the Agricultural Department with reference to the same pest, in which it was suggested that authority should be sought to proclaim areas, and close them to the introduction of the fruits concerned from without, and making it illegal to sell fruit from without in such areas, and providing for such regulations as might prove necessary. As the interest of fruit dealers and fruit consumers was involved, it might be well to let others than fruit growers have an opportunity to voice their views. Such a course would give the Western Province shippers, Eastern Province receivers and importers, and also Eastern Province jam makers a chance to protest if they believed the action desired not justified.

Mr. Cloete proposed that the following resolutions be sent to the Eastern Province Board of Horticulture on the matter:

That this Board is of opinion that the proposed legislation is not at present desirable: (1) Because there is no proof that codlin moth does not exist in the area proposed to be proclaimed. (2) That in view of this fact the effect of this position would probably be to do a great deal of damage to the fruit-growers of the west without assisting the fruit growers of the east in arriving at the effect they have in view. (3) That the effect of this legislation would probably be to unduly heighten the price of fruit in the proclaimed area, especially as we have no proof as to the quantity of apples, pears, and quinces grown in their districts.

The resolutions were unanimously agreed to.

LOCAL OPTION BILL.

The Local Option Bill to check the spread of plant pests and diseases was, on the motion of Mr. Bulmer, postponed for a year. He said that it would be much better to let the Nursery Bill have a chance.

CAPE WINES—PROPOSED SPECIAL LICENCES.

The following report was submitted by the committee appointed at the last Vine and Fruit Growers' Congress to enquire into: "(1) The advisability of recommending to the Government to arrange for a licence apart from the ordinary licence for sale of Cape wines only; (2) the advisability of recommending to the Government to grant bonuses for wine exported; (3) the advisability of recommending the Government to introduce a Wine Adulteration Bill, on the lines of the Bill adopted by Victoria; (4) means and ways to assist the formation of co-operative wineries."

No. 1—The consumption of natural light wines, as can be and are produced at the Cape, such as Hermitage and Drakenstein, is not nearly as large as it should be, principally on account of such wines being retailed at too great a charge, which is to some extent accounted for by the high liquor licence and general lack of facilities for obtaining same at a reasonable price. An increased consumption would be a great benefit to the wine industry, and at the same time tend to improve the conditions of the country, as a consumption of such wines tends to reduce drunkenness. This statement is borne out by the fact that the labouring classes who only consume the natural wines of the country are more sober than those frequenting the bars in the different villages, where they as a rule consume the vilely-fortified wines. These light wines are rarely obtainable in the up-country districts, and where sold, sold at a prohibitive price, so that people prefer purchasing spirituous liquor, mostly imported. The committee therefore recommend that three classes of licences be arranged for: (1) The usual licence of £40, as at present in vogue, allowing for the sale of all kinds of liquor, whether imported or produced in the country; (2) a licence of half the former, *i.e.*, £20, allowing only the sale of South African wines containing not more than 20% by volume of alcohol. (This licence would principally concern the canteen trade, as many of the frequenters of canteens prefer a slightly sweetish wine, the sugar of which must be preserved by an addition of spirit to the wine); (3) a licence of a quarter of the usual licence, *i.e.*, £10, allowing only the sale of South African wines of not more than 14 per cent. volume of alcohol, in boarding and eating houses, restaurants and cafes, at meal times only, and at such other third-class licensed premises as may be permitted for the sale of such wines.

No. 2—*Re* bonuses. The committee recommends that the Government give a bonus of 6d. per gallon for all wine grown and produced in the Cape Colony, when exported beyond the limits of South Africa. 'Although these bonuses will, from the start, operate principally in favour of the wine merchant, it is held that in the long run the producer will also benefit from them, as the trade generally would revive, and farmers themselves, particularly co-operative wineries may in time become exporters.

No. 3—From the evidence collected by the committee, it is apparent that there is a considerable amount of adulteration of brandy, particularly by the up-country retailers, individual cases of such adulteration having been brought to the notice of the committee. It was, however, generally held that little adulteration is practised, in regard to wine. The clauses 6, 7, 8, and 9, of the Sale of Foods and Drugs and Seeds Act of 1890 provide, in the opinion of the committee, sufficient power to prosecute persons for adulteration, but it was also conclusively shown that the provisions of this Act are not sufficiently enforced, and the committee would recommend that the Government be requested to enforce the Act more rigorously, and provide for the systematic control of the liquor sold in order to prohibit adulteration. It would, however, appear advisable to define the meaning of adulteration, and adopt the definitions as found in the Victorian Act in paragraph 6 (a) and (b), from 1 to 7, with such alterations as may appear expedient and advantageous. Such a step would obviate the necessity of getting in each case expert evidence, which is often contradictory.

No. 4: With regard to the last point, the committee considers co-operation among farmers in respect to wine-making essential, and a *sine qua non* to the production of uniform types of wine in quantities, and propose that the Government be approached with a view to granting financial assistance to co-operative wineries by either loaning money at a cheap rate of interest or by granting certain sums of money to central wineries, wherever such are being established by farmers.

(Signed) C. Mayer.
P. J. Cilliers, C. son.
D. De Vos Rabie.

This report was adopted and the Board adjourned.—*Cape Times.*

IRRIGATION IN THE KARROO.

Successful and Unsuccessful Schemes.

(By P. J. du Toit.)

As the Colony seems to have awakened to the value of irrigation and the subject is frequently discussed, it is perhaps not inopportune to consider the various irrigation schemes that have been undertaken in the Karroo, where they are needed most, and to compare the unsuccessful with the successful ones.

Attention is so often focussed on those on which the Government have spent, unprofitably, large sums of money, that the successful ventures, which, with one exception, have been carried out by private enterprise, are lost sight of. This is doubtless due to the fact that Government projects are everybody's business, while private ones directly concern a few only. The more important of the successful schemes are in what has been called the back country, namely, on the Visch River, the Zak River, and the Orange River.

The irrigation works of this Colony, successful and unsuccessful, may be divided into three classes:—

I. *Unsuccessful.*—Flood water conserved in a large dam and led on to arable land *below* the wall.

II. *Successful.*—Flood water impeded in its course and spread over arable land *above* the wall.

III. *Successful.*—Irrigation by means of a furrow from a perennial stream.

Under No. I fall the Van Wyk's Vlei dwarf, the still-born Rooiberg dam, and the miscarried Thebus project

Van Wyk's Vlei—Here a huge dam was built, the wall of which, speaking from memory, is about half a mile long. Its catchment area extends back to the Karreebergen, a distance of about 35 miles. In ordinary years the water in the dam covers an area of several square miles. A furrow is laid out from the dam to the lands below. The soil is brak, as is the case in nearly the whole of the Karroo. Three to four times a year the lands are irrigated from the furrow. About 50 sowing lots of 10 morgen each, besides a few small garden lots, are so watered. A bag of wheat is sown to two morgen, and the average yield is about 13 or 14 bags from 1. If the whole of the 500 morgen be sown, 250 bags of wheat would be required, and the return would be about 3,000 bags. Small as the yield is, in a tract of country with a rainfall less than 10 inches a year such a production is a boon. But the success or failure of the scheme must be measured by other standards: the supply of water, the soil, and the outlook.

When the dam was built, it was anticipated that the supply of water would be much larger. As a fact, there is barely sufficient in ordinary seasons for the 50 lots; and in dry seasons there is a scarcity. Next is the question of soil. Cultivation commenced below the dam wall; it has now receded a distance of about seven miles, owing to the amount of salt which has accumulated on the surface. When the scheme was brought into being, the question of brak appears not to have been considered from an agricultural point of view. No drainage was provided, and capillarity has brought to the surface the salts contained in the water underground. In his lucid article on "Brak land in relation to irrigation and drainage," in the May, 1903, number of the *Agricultural Journal*, Professor MacOwan explains the natural law by which salts are accumulated on the surface. He says:—

"It will be asked: From what source does this often large proportion of salts arise? Undoubtedly it is derived from the water contained in the deeper portions of the soils, and has been dissolved out from the weathered and comminuted rock detritus of which that soil consists. Yet such water, when reached by digging, may be scarcely perceptibly saline, and the same may be said of the soil itself, a few inches below the surface. The efflorescence then must be produced by slow and continual accumulation, in the absence of any counteracting cause operating for its removal. The column of soil, reckoning from the water-level to the surface, acts precisely like a lamp-wick delivering oil from the reservoir to the highest level of the flame. By capillary attraction it draws up the moisture to the surface, and delivers it there for its small percentage of saline constituents to be crystallized out by evaporation. And as this process is continuous so long as there is no rain, one can understand how soils containing no more than 1·68 and 1·02 per cent. of salts readily accumulate a white coating of brak upon their surface. The delivery from below, though small, never ceases during dry weather, and practically nothing is carried away.

"Let us now consider what happens when the periodic African rains come upon such land. It might be supposed that all the effloresced salt delivered upon the surface since the last rainfall would be washed away, and escape into the superficial drainage of the district, and so into the river system of the country. This is far from being the case. The first effect of rain is to dissolve the salt rime lying upon the surface in a few minutes, forming a strong solution. The earth, which has carried it so long, is dry and porous, and instantly absorbs this solution long before the precipitation has been sufficiently copious to cause any perceptible water-run along the natural slope of the land. And thus it comes about that even a rainfall of many hours' duration is powerless to decrease perceptibly the content of brak salts in the superficial layers."

This is what has occurred at Van Wijks Vlei, and is still proceeding. Brak is also appearing in the lands now being cultivated, a distance, as has been said, of about seven miles below the dam. In addition to wheat, Van Wijks Vlei produces what its advocates probably never dreamed of—a large quantity of good salt, for which there is ample demand! Trees planted years ago, on ground cultivated at first, show pitiable suffering. But the best proof of non-success is in the fact that the population has decreased. Just as salt has squeezed out cultivation nearer the dam, so in time it will render the present lands unproductive.

Rooiberg.—The next birth in the same family was the Rooiberg dam. This dam, or what was one, is situated about nine miles south of the village of Kenhardt. A wall of about 900 yards in length was thrown across the Hartebeest River bed. It was estimated that when the dam was full the water would stand back a distance of six miles. Below the dam is a deep deposit of alluvial soil extending to below (*i.e.* north of) the village. The soil is less fertile than along the Orange, the Vaal, the Zak, or the Visch River; but under irrigation it should yield a good return. About three months after the dam was completed, the Hartebeest River came down in flood, as it does every year except in extreme drought, and about 100 yards of the wall, towards one side, gave way. £50,000 had been spent. The dam is still an object of attraction, for a wreck is at least as interesting as a vessel afloat. But we have here to do with what, in all probability, the scheme would have been, had the wall resisted the force of the flood. Why it broke—there are a good few theories—need not be entered into now. Supposing that the dam had not broken and was capable of supplying sufficient water to irrigate a very large, or even the whole extent of the available land below it; still the test of success would have been the soil. Now, over the arable ground is spread a large quantity of tall ganna, or what is also called salt ganna. All gannas are brak, but the salt ganna, as its name denotes, is saltest of all. The abequa tree gives another plentiful indication of brak. The *lidjes* ganna, or *aschbosch*, is another proof. Indeed, the soil is silt brought down by the river from Van Wijks Vlei and other parts, all of which have brak. The conditions of Van Wijks Vlei would inevitably have been repeated here. It is to be hoped, therefore, that the dam, in its present position, or without the provision of drainage, will ever remain what it is—a gateway giving some scenic effect to the Hartebeest River.

Thebus.—Next we come to the Thebus scheme, which was to have been on the same principle as the Van Vijks Vlei and Rooiberg works. £30,000 was spent on it and then it was abandoned. Brak patches below the site of the dam can be seen by anyone passing by rail. If the scheme had been persisted in, and it had reached completion, there can be little doubt that we should have had dwarf No. 2.

II.—Irrigation by Arrested Flood Waters.

The second class of irrigation works, hardly known beyond the confines of the districts which they serve, are the main object of this article. Without expert assistance, but with keen observation and sound common sense, the projectors turned many square miles of veld into cornfields. They simply inverted the old order of things: they did not conserve the water and then spread it over the lands below stream; but they stopped it below the lands and threw back the water. The idea was a very simple one and the scheme is all the more fascinating for its simplicity.

Tondelboschkolk.—The first of these works was initiated on the farm Tondelboschkolk, in the district of Calvinia. The Visch River, which is a tributary of the Zak River, flows through the farm. Periodically, once to three times a year, it carries down a large volume of water. In its course it travels through some thousands of morgen of level arable ground. The owner did not build a huge wall, some 30 or 40 feet high, across the stream at the upper end of the lands and then dole out the water as the lands might require it; but he built a long, low wall below the lands, and by this means threw back as much of the water as the wall could stop or impede. As much of the water as was stopped and thrown over flat ground, where it soaked away, deposited the soil it carried in suspense from the area which it drained. Breakages in the wall, which was comparatively inexpensive, were repaired at small cost, and the process was renewed. Gradually the bed of the river was silted up; and as this occurred the water spread out further over the lands and lost force. As it lost force, the better the wall answered its purpose. Every year the lands got a coating of virgin soil. This was begun about twenty-four years ago. Provision was made for years of deficient rainfall by taking a furrow out of the river above the lands. This furrow leads into a large dam, about a square mile in extent, above the level of the lands. Should the crops show signs of suffering from drought, the dam is opened and the water spread over the lands. The occupiers of the farm cultivate about half of the arable ground. They can cover a greater extent with water, but if they cultivate more they will have no market for all their grain. But that is another question. About half of the area tilled is sown in one season: the other half gives a self-sown crop. The following year this second half is sown, and a self-sown crop is taken off the other. The soil is as fertile as can be desired. One of the occupiers states that a stool of wheat had been pulled up there containing over 500 heads, large and small, developed and undeveloped. The writer and a friend walked a few yards into a field of self-sown wheat, and each pulled up what he considered the largest stool at hand. The one had 201 heads, and the other 234. In favoured localities the yield exceeds 100 from one. The average yield is about 45 from one. Up to 11,000 bags of wheat are annually produced on that farm. The advantages of this system are apparent and important: (1) Beyond the initial cost of construction of the resisting wall and the expense of its maintenance, there is no expense as regards irrigation; (2) Manure is not required; (3) There is no brak problem; (4) The cost of cultivation is small; (5) The richness of the soil is maintained. Rust is unknown there, neither is it at Blok-zijn-Kalk West, in Kenhardt district, where the same system is in vogue. What bearing the fresh yearly deposit of soil has on the question of rust, it would be interesting to know.

BLOK-ZIJN-KALK WEST AND GROOT LEMOENKOP WEST.

The men who have been so successful at Tondelboschkolk naturally extended their efforts to other places which afforded similar opportunities. About ten years ago they acquired the farm Blok-zijn-Kalk West and the adjoining property called Groot Lemoenkop West. The Zak River, which has its source in the Nieuweveld Mountains in Beaufort West district, covers, when in flood—which occurs at least once, and generally twice, a year, except in extreme drought, as in 1903—a stretch of ground about three miles in width, on those two farms. It has no bed in Kenhardt district—scarcely a depression. The only feature to mark its course there is a dense growth of *karreedoorn* and *ijzerdoorn*, fairly tall bushes, which stand out in relief from the short karroo bushes on either side. The whole of the course is cultivable, and the soil is deep and rich. One flow of the river ensures a crop, while two flows make an abundant yield certain, unless locusts or a late frost should appear, which seldom happens. The owners built a dam, about 14 feet high in the centre, and about 3,300 yards long, across a great part of the bed. The method of irrigation is here the same as at Tondelboschkolk. A bag of wheat is sown to three morgen of land, and the return from one bag averages about thirty-six bags. Owing to two severe droughts and to the war, not much progress could be made during the ten years. The largest harvest was about 1,250 bags of wheat. The area under cultivation is very much extended this year, but it is doubtful whether a market will be found in the neighbouring districts for a much larger yield than 1,250 bags, in view of the success of the Kakamas Labour Colony and the absence of rail transport. However, the fact remains that irrigation on the Tondelboschkolk system is successful. The two farms are now leased, and the lessee has commenced to cultivate below the wall as well as above it, with the result that salts are accumulating on the surface immediately below the dam, as at Van Wijksvlei.

It has long been the practice in the districts of Calvinia and Kenhardt, and probably others, to sow in small dams when the water has given out. The Tondelboschkolk system is an extension of the same principle.

Now, the area which it was proposed to irrigate from the Rooiberg dam affords the same facilities as Tondelboschkolk; and in my opinion the owners of that farm, if they had had the Rooiberg project in their hands, would have built their dam, not above the arable land, but below it.

III.—IRRIGATION BY MEANS OF A FURROW FROM A PERENNIAL STREAM.

There are three extensive schemes of this kind in the Colony: (1) On the Vaal River, at Douglas, carried out by the Government; (2) on the Orange River, at Upington, initiated and carried out by the Rev. Mr. Schröder on behalf of the local Bastard community; (3) on the Orange River, at Kakamas, in the Kenhardt district, carried out on the recommendation and under the direction of the Rev. Mr. Schröder for the Dutch Reformed Church.

Upington.—The oldest of these is the one at Upington. The water is taken out of the Orange River on the north bank, the intake being about 6 miles above the village. The furrow extends to a point about 14 miles below the village, and is thus about 20 miles long. The irrigable land, which is alluvial, lies along the river bank, and covers an area of about 2,000 morgen. Grain crops yield good returns and fruit trees answer well.

Douglas.—The Douglas furrow, which is next in point of age, is led out of the Vaal River on the same principle as the Upington one. The intake is about nine miles from the lands, which are in the village. About 275 morgen of ground is under irrigation, but more land could be irrigated if the water supply were increased. The cultivated lands are capable of producing good returns.

Kakamas.—Last, but not least, comes the Kakamas scheme. This is a very large undertaking, and is still in its childhood. The furrow is taken out on the south bank of the Orange River, on a farm called Neus, in the district of Kenhardt. The furrow, with a length of about thirty miles, winds along the foot of a mountain and along hills and through valleys, over the farms Neus, Zoetap and Kakamas. The principal irrigation is done along the bank of the river at Kakamas. From a point about fifteen miles above (*i.e.*, east of) Upington, down to the Great Waterfall, a distance of about eighty miles in all, the Orange River, when in flood, splits up into a number of channels, varying in number according to the configuration of the country. These have been formed, probably, by silt deposited against rocks and bushes and trees from time to time, which has accumulated and has diverted part of the stream, gradually extending or forcing out the banks and forming more channels. In some parts, now, the river, when in flood, has a flow of about two to three miles wide. The land between the channels is known as islands, though in normal times many of the so-called islands really form part of the mainland. Only the larger islands are not covered in flood time. The islands have a thick growth of trees, some of which, like the ebony, the bastard yellowwood, the karree, the zwartbast, the camelthorn, etc., are valuable. The alluvial soil along the banks of the river is also wooded, but much less so than the islands. At Kakamas the ground along the bank was first parcelled out, in lots of six morgen each. Trees and scrub were removed and the ground levelled. The last harvest was about 3,000 bags of wheat. A beginning has now been made with the islands, the soil of which is said to be more fertile than that on the river bank. A canal has been constructed to one of the water-courses, or channels, and by means of a syphon the water from the furrow is carried underneath the channel to the island on the other side. The same is to be done, or perhaps is now being done, to reach another island. It is estimated that over 700 morgen of ground can be irrigated. Families of poor whites, adherents of the Dutch Reformed Church, from all parts of Cape Colony, are settled there. There is no need for the purposes of this article to enter into the details of planting the men on the soil. That the scheme will, so far as irrigation is concerned, continue to be a success, the work at Upington is sufficient guarantee. There is a certain amount of brak, but, in view of the natural drainage, that need excite no alarm.

The same safeguard against brak exists at Upington and at Douglas.

We have seen that of three different systems two are successful and one is a failure. That at Tondelboschkolk and at Blok-zijn-Kalk West is essentially different from either of the others. The river schemes differ in principle from the Van Wijksvlei one in that they have drainage naturally provided. At Van Wijksvlei, as Professor MacOwan has pointed out, there is no provision for carrying away, by under-drainage, the water which is from time to time thrown on the land. There appears to be no reason why, if this indispensable concomitant be supplied in schemes on the Van Wijksvlei principle, we should have a failure there or at Rooiberg or at Thebus, unless the cost of construction of the dam and of the provision of drainage were to be disproportionate to the advantages to be derived; but if these systems be compared, the experience furnished by Tondelboschkolk indicate that the one there adopted in the simplest, cheapest and most productive. Of course, sight is not lost of the fact that it is not applicable everywhere; but there are other localities in the Colony where it can be applied.

EASTERN PROVINCE FRUIT GROWERS' CONGRESS.

TUESDAY AND WEDNESDAY, NOV. 22 AND 23.

The Annual Congress of Eastern Province Fruit Growers was held at East London this year, in the Council Chamber of the Town Hall. It was opened on Tuesday, Nov. 22, and continued on Wednesday, Nov. 23, the business including some important decisions. The delegates present were: Messrs. C. Sansom, Green, and Ray Ulyate (East London), J. W. Venables (N'cera), Fletcher (Macleantown), A. Landrey and H. Ella (Lower Cathcart), W. Warren (Stutterheim), Jas. Leighton, F.R.H.S. (King William's Town), R. H. Pringle (Bedford), F. L. Grey (Lower Albany), A. J. Collett and Verster (Cradock), E. W. Cawood (Herbert), G. H. Maasdorp (Albert), H. Flanagan (Komgha), R. Malleson (Western Province Horticultural Board), G. A. Fincham (Queenstown), C. W. Mally (Government Entomologist), F. D. MacDermott (editor *Agricultural Journal*), and W. Goulden (Secretary).

Mr. J. Leighton (King William's Town) was unanimously elected chairman of Congress.

A deputation from the Chamber of Commerce of East London, consisting of Messrs. D. D Nisbet, Chairman, D. J. Griffiths, vice-Chairman, H. B. Cuming, and R. H. Price, welcomed the Congress to the town.

Mr. Nesbitt, speaking for the deputation, said he had been deputed to extend, so far as the commercial community were concerned, a hearty welcome to the gentlemen attending the conference. It had often been said by the professional politician that the town and country must be very much opposed in interests, but in his opinion there was no reason at all why such a difference should exist (hear, hear). So far as the commercial bodies of East London were concerned, there was at any rate nothing but the warmest sympathy with the difficulties the farming community had got to contend with especially in this country. Anything they could do in a sympathetic way they would always be prepared to do, and any grievance the horticulturists might at any time put before them would be considered in a sympathetic spirit, and as a commercial body they would always be glad to help them as far as they could (applause). There was no reason at all why town and country interests should not be identical if a proper spirit were maintained instead of a spirit of antagonism, which the professional politician often tried to bring to the surface. They realised, especially in fruit farming, that country people had difficulties to contend with which were perhaps unique in farming in this country, and perhaps they required more support from a paternal Government than other branches of farming. Of course, people in the towns sometimes thought the farmer got perhaps too much nursing now and again, but they realised that in a Congress of that kind, in discussing questions affecting themselves they were bound to discuss questions which would ultimately affect the well-being of the country, and in considering their difficulties they were not only bound to assist each other, but also to do something for the benefit of the country in which they were living, and which many of them hoped to end their days in. Commercially they were entirely in sympathy with the Congress, which they wished every success, and they hoped their deliberations would benefit themselves, because in benefiting themselves they would also benefit the country at large (applause).

The chairman having thanked the last speaker for his sympathetic welcome, the deputation withdrew.

The Town Clerk tendered the apologies of the Mayor for unavoidable absence, owing to indisposition, and offered the Congress a hearty welcome in the name of the Municipality.

The chairman having briefly replied, the business of the Congress commenced with the reading of the following:—

REPORT BY THE SECRETARY.

Gentlemen.—Those of you who, since the formation of the Eastern Province Horticultural Board, have taken a keen interest in fruit growing, have no doubt often speculated whether the Board had not entirely collapsed, and that was the reason why the usual Congress was not held last year as it should have been. You must have been agreeably surprised to find that the Board, and the associations represented by it, were only suffering from a mild attack of "beri beri" brought on by reaction after the troublous times through which the Colony had just previously passed followed by an existing political crisis and a general election. Under these conditions it was not even possible to obtain a quorum for a Board meeting much less a general Congress, and your executive, whilst deploring the straits to which they were put, determined, nevertheless, to keep the Board alive, until such times as the members and the associations they represent felt the loss of their privileges and the possibilities for good.

The executive are now glad to be able to report not only an awakening, but an increased interest in horticultural matters throughout the whole of the Eastern Province. They are encouraged to believe that this is a genuine awakening to the importance and far reaching possibilities of the fruit growing industry of the Eastern Province of the Cape Colony.

In past years much has been done by the Government to foster and encourage our efforts by the periodical visits of experts, orchard competition, establishment of horticultural boards and fruit growers' associations. Experts have been permanently attached to the Agricultural Department, and especially in the Entomological branch good and sound work has been accomplished and thoroughly appreciated by the general body of fruit growers. Much yet remains to be done before we can safely feel we are out of the experimental stage or before we can overtake the years we have lost, whilst in that stage.

There are still many difficulties and drawbacks which tax our energy, determination and intelligence, and sound legislation is required to enable us to overcome them.

It is our special province to bring intelligence and determination to bear upon these difficulties and drawbacks affecting our interests so that the Government may be in a position to legislate with effect.

The voice of the general body of practical fruit growers is anxiously awaited by the Minister for Agriculture.

Few individuals will be found so charged with undiluted selfishness as to question our motives in promoting and prosecuting the growth of the choicest and most delightful mouthfulls of delicious enjoyment. Townsmen tell us they are all too few and far between.

We have before us one of the most interesting, healthy, and lucrative businesses. The more we develop, the more friends we create, the more blessings we confer on the general community, ourselves included, the more recognition we shall command from commercial men; and our Government, who are specially pledged to the development of the internal resources of our Colony, will be encouraged to grant every possible assistance in furtherance of an object which is calculated to bring prosperity and happiness to all who are engaged in it, consumers as well as producers. Our industry thoroughly prosecuted throughout the Colony will do much to bring peace and harmony and prosperity by cultivating a healthy rivalry. We recognise no nationality or race, no political bias; we recognise it is our duty to assist, encourage, and emulate each other in producing the choicest varieties of fruits in bountiful quantities so that our efforts may redound to our credit, extort a generous tribute from our fellow citizens and command a worthy recognition and support from our Government.

We can do much on account of our intermediate and climatic conditions "geographical and physical" to raise our Colony to a much more important position than it has hitherto enjoyed in the British Empire, and, as individuals, leave the world the better off for our having done our duty whilst living in it.

During the interregnum your executive have kept in touch with the Department for Agriculture, and have taken action in your interests where it could be done without reference to the Board or to Congress.

These items will be laid before you for your consideration and decision and will be found in the agenda paper. The question of having an Entomologist permanently established in the Eastern Province, we have the assurance of the Minister for Agriculture that our wishes will be met.

As also the establishment of Government guano depots is under consideration.

The Nurseries Inspection and Quarantine Bill as drawn by the Department under the supervision of Mr. Lounsbury, Government Entomologist, has practically received the sanction of both Boards, and it is intended to pass the same through Parliament next session, also a Bill drafted by the Western Province Horticultural Board to check the spread of plant pests and diseases from orchards, gardens etc., styled "The Local Option Plant Pest and Disease Act." The import regulations for plants and trees are still in an unsatisfactory condition.

The question of doing away with the Eastern Province Board and establishing a single Board for the whole Colony in the Western Province is submitted to you by the Agricultural Department for consideration.

Legislation is still urgently needed for the destruction of locusts and prevention of the spread of codlin moth.

In conclusion the executive trust that now new energy and life has developed in horticultural interests the work of the Board will go on smoothly and regularly, and that the districts and associations represented by the Board will not only support it to the fullest extent and make it the medium through which progress and legislation to that end may be brought about, having past experience that the Minister for Agriculture is only too ready and willing to carry out the wishes and desires of the united body of practical fruit growers, we may rest doubly assured that in the future we shall receive every consideration, trusting that the rift in the cloud of depression which has so seriously affected all and every interest lately, may widen in brighter sunshine of prosperity, and that with the increasing revenue of the Colony urgent national interests may be grappled with in a manner befitting their national importance, and that nothing shall be lacking on our part to prevent this desired result.

The report was accepted and the Secretary, on the motion of Mr. Venables, thanked for its preparation.

PLANT IMPORT REGULATIONS.

The first of the recommendations of the Horticultural Board was then considered, viz. :—

"That the ports of East London and Port Elizabeth be opened to receive imports of plants and trees, etc., and the Government be asked to make efficient regulations to carry out same, and in the matter of parcels post the plants, etc., be sent to each port or to any place where proper arrangements exist for fumigation of trees and plants under Government supervision."

Mr. Mally said he found that anything that was permissible under the proclamation could come into the ports of East London and Port Elizabeth just the same as at Cape Town. The only question to decide was whether they were satisfied with the efficiency of the staff and equipment doing the work at the two latter ports.

If they were not they should make their wants known to Government.

The Chairman said he understood they had an efficient staff at Cape Town, and he could not see why they should not be treated as well in the Eastern Province.

Mr. Pringle thought it was a matter of expenditure, as the Government could not afford to keep up three different staffs just now. He also thought there was less chance of disease spreading if there was only one port of entry.

Mr. Goulden said that if East London and Port Elizabeth had not as efficient staffs as at Cape Town, they were naturally in a worse position. The question of expense to the Government was one side of the question, and the benefit to the whole of the Eastern Province the other side.

Mr. Warren remarked that as the ports were open, the first part of the resolution was not required, and what they wanted to do was to ask the Government to provide efficient staffs at Port Elizabeth and East London.

Mr. F. L. Gray said that if the trees were properly re-packed at Cape Town, importers would not lose so many, and if the Government had a capable man to superintend the work it would get over the difficulty.

The Chairman said the packing of trees and plants was a fine art, and unfortunately, when they were fumigated at Cape Town they were frequently re-packed very carelessly.

Mr. Warren moved that the resolution should be altered as follows:—"That the ports of East London and Port Elizabeth being open to receive imports of plants, trees, etc., the Government be asked to make more complete and efficient arrangements for the fumigation of the same, and in the matter of parcels post the plants, etc., be sent to each port or to any place where proper arrangements exist for the fumigation of trees and plants under Government supervision."

This was agreed to unanimously.

The Nurseries Inspection Bill.

Clauses 2 and 12 of the proposed Nurseries Inspection and Quarantine Bill having been referred by the Horticultural Board for consideration by Congress, discussion proceeded. Some doubt was expressed as to the application of the term local nursery.

Mr. Malleson said he believed Mr. Lounsbury's idea was that it should be applied to amateurs, and not to people who sold plants and trees.

Mr. Warren moved, seconded by Mr. Gray, that Congress should give its approval to the clause.

The Secretary moved that the paragraph referring to local nurseries should be struck out. He did not see why farmers should be prevented from growing their own stocks, and selling them, or of giving them to their friends. It was an arbitrary clause, and it ought to be struck out, and the Bill, as originally intended, apply only to general nurseries.

Mr. Warren pointed out that the Bill was intended to prevent the spread of insect pests, and there was just as much danger of this being done if a farmer gave his trees away.

Mr. Mally said there would be no restrictions on a local nursery when it had once been inspected and reported clean. There was no idea of preventing the local man from doing business, but only to prevent disease being spread.

The amendment was not seconded.

Mr. Malleson urged that they should look at the broad question of the benefit that would be conferred on fruit growing, and not at little matters as to the way in which it might touch the susceptibilities of this or that individual.

Approval of the clause was then given.

Clause 12, making fumigation of trees compulsory just before being sent away from nurseries, was then submitted, and on the motion of Mr. Venables, seconded by Mr. Warren, Congress expressed agreement with the clause.

Mr. Malleson said that in Mr. Lounsbury's opinion there was no effective way of killing pests in trees before they were sent away, except by fumigation.

Mr. Goulden moved, and Mr. Flanagan seconded, that the Bill as drafted should be accepted in its entirety.

INSECTS REPRESSION BILL (PERMISSIVE).

On the local Option Bill (Insects and Plant Pests) submitted by the Western Province Horticultural Board, Mr. Malleson said it was the strongest thing they dare bring forward, and was the thin end of the wedge to show what could be done towards the destruction of insect pests. When that had been done, they would possibly be able to get a stronger measure. It would affect the Western Province only, and would not touch this part of the Colony for some time to come. If the Bill became law, there was a probability of at least two districts in the Western Province giving it a trial.

On the motion of Mr. Goulden, the Bill was approved.

EAST AND WEST—CO-OPERATION SUGGESTED.

Congress next considered a letter from the Minister for Agriculture, in which the following resolution from the Western Province Board was forwarded: "That the Government be asked to write to the different fruit growers' associations of the Eastern Province, inviting them to send representatives to the Western Province Board with a view of having joint representation of horticultural interests."

Mr. Malleson said the Western Province Board had an idea the Eastern Province Board had not been holding meetings, and that they were not going to carry on the work. In these circumstances they thought it was only fair the fruit growers of this part of the Colony should be represented on the Western Board. Of course, they could see now there had been a misunderstanding; but another point was that they wanted to bring the Boards of the two provinces into closer touch with each other, as their interests were identical. To further this he suggested that Congress should hold their next gathering, simultaneously with the Western Province Congress, at Oudtshoorn, or, failing this, that they should send to the Congress as many delegates as possible from the various Associations.

Appreciation of the invitation was expressed by several members, and it was thought that it would be a good thing that the two Boards should meet together and discuss matters of general interest to fruit growers in both parts of the Colony.

Mr. Goulden pointed out that there were climatic differences in the condition of the two provinces which prevented the whole fruit growers of the Colony coming under one Board.

It was agreed, in reply, to inform the Department that the Associations already sent delegates to the Eastern Province Board, but that they would be glad to consider any invitation that might reach them to attend the meetings of the Western Province Board.

EXHIBITION OF COLONIAL FRUITS IN LONDON.

A letter from the Agricultural Department was read, informing the Congress that at the end of March or the beginning of April, an exhibition of Colonial fruits was to be held in London, under the auspices of the Royal Horticultural Society.

Mr. Malleson said that so far as the Western Province was concerned, some of the exhibits at their February show were to to be sent to London and he had no doubt they would also be pleased to include anything from the Eastern Province, and thus extend the facilities they were arranging for.

WANTED, AN ORNITHOLOGIST.

The following resolution from Lower Albany was moved by Mr. F. L. Grey: "That Government be asked to make a thorough investigation of the food habits of birds, by means of the temporary appointment of a duly qualified official, to be called the Government ornithologist, in order to ascertain and definitely determine the noxious birds of the Eastern Province.

Mr. Malleson urged that any interference with birds was a most dangerous thing, and that they should be careful how they approached the matter. He suggested that Government should be asked to empower Mr. Sclater the curator of the South African Museum to continue his investigations with regard to the habits of birds. That gentleman had published one book on the subject.

On the same subject there was a resolution from East London urging the systematic destruction of fruit-eating birds, but

Mr. Landrey pointed out that the East London resolution did not differentiate between the birds that also destroyed insects.

Mr. Goulden said there were some birds with regard to which there was no need of investigation to prove that they were fruit-eating birds. The tip-tol and the mouse-bird were birds that were abominated by fruit growers. In his opinion the quail was one of the best friends of the farmers, yet it was one of the most shot at little birds in the Colony.

Mr. Ulyate said there was one bird that ought to be destroyed, that was the mouse-bird.

The resolution was then put and carried, the word "temporary" being struck out, and "Colony" being inserted in the place of "Eastern Province."

Codlin Moth.

Mr. Gray also submitted the following resolution; "That, in view of the terrible ravages of codlin moth in the Western Province, Government be asked to recognise the pressing necessity for the immediate passing of the Insect Repression Bill in the widest and most comprehensive sense in order to secure those areas from infestation to which the codlin moth has not yet penetrated, and to provide for expert examination at the sea-ports of the diseased fruit now being distributed broadcast over this and the adjoining colonies." He said they stood in great danger of the pest being introduced into this part of the Colony, so long as apples were allowed to be brought in from the Western Province.

The Secretary read a letter from the Minister for Agriculture, who stated that the Bathurst Association had written to the Government urging them to take steps to prevent the codlin moth spreading from the Western to the Eastern Province. He pointed out, however, that adequate protection could not be afforded without special legislation, which would stop apples, pears, and quinces being imported from the districts already infested. The codlin moth was known to have spread through the Western Province to about Graaff-Reinet, but it was not known in the divisions on the Grahamstown line, and on the Eastern system. He asked for the opinion of the Board as to the desirability of adopting this course, and making the railway lines mentioned a line of demarcation.

The Chairman said it was very satisfactory that the Department had grasped the situation and were prepared to take the necessary steps.

Mr. Malleson said that if fruit from the Western Province was stopped from coming into the Eastern Province, it would be a serious blow to Western growers, and might jeopardise fruit growing in South Africa. He suggested there should be a thorough inspection of all consignments of fruit from the Western Province and from over sea, because they were just as much in danger of the codlin moth from Australia and Madeira, as from the Western Province.

Mr. Grey said the best thing the Western Province could do was to get rid of codlin moth and then their fruit could be sent to the East.

Mr. Goulden said if they were going to stop the spread of codlin moth the suggestion of the Agricultural Department was a good one.

Mr. Malleson said all the large shippers took care that no apples with codlin moth on them were allowed to leave their packing sheds.

Mr. Warren said that much as they sympathised with the people in the West at losing their markets, they must look after themselves, and if the Secretary for Agriculture's suggestion was going to keep the codlin moth out of the Eastern Province, then they ought to support it.

It was unanimously resolved to approve of the proposal made by the Secretary for Agriculture.

GOVERNMENT GUANO.

Lower Albany also brought forward the following resolution: "In view of the future value to the agriculturists of this Colony of the Guano Islands, as being a most important factor in the re-establishment of improverished lands, which impoverishment is already exhibited in the increasing use by the older established portions of the Colony of inferior and exhaustive fertilisers, that this Congress desires to impress upon Government the great necessity of intelligently conserving the same for the greater contingencies of the future, and not to sacrifice this most valuable asset to the pressing financial needs of the moment."

Mr. Mac Dermott, however, pointed out that the guano was not exported, but was sold to farmers at, practically speaking, the cost of collection.

On this explanation the resolution was withdrawn.

Another proposition from the same source, requesting the Government to establish guano depots in the Eastern Province similar to those extant in the West, was however, agreed to, after being seconded by Mr. Warren.

FUTURE FRUIT PRODUCTION.

The last resolution from Lower Albany was the following: "That a further continuation of the present rate of fruit tree planting in the East is calculated to leave a large surplus of fruit in the near future, after the most extravagant requirements of the available markets have been met and supplied, which can only become remunerative by exportation. Government should be requested to outline the probabilities of the requirements of the Eastern Province fruit-growers in this respect being provided for."

Mr. Gray said what they wanted to do was to obtain facilities for exporting fruit.

Mr. Malleson said the Harbour Board in Cape Town had established a cold storage at the docks, and the consignments to be sent away were looked after by the Exporters' Union. The export trade had not been a success so far, and he would not advise small growers to go in for it. With regard to consignments for Johannesburg and the up-country markets, they found the middleman and the market agents were making all the profits, and they decided to consign the fruit themselves. He thought it would be a good thing if they could have an amalgamation of all the growers in the country in this direction.

Mr. Goulden seconded the resolution.

Mr. Landrey referred to the excellent prices obtained for fruit now as compared with thirty years ago, notwithstanding the growth of the industry, yet they proposed to export fruit to the British Isles, where they could already supply all that was wanted.

Mr. Malleson said that on an average they got £36 a ton for fruit in this country, whereas in England they could grow fruit and make it pay at £8 a ton.

Mr. Green said they had far better markets in this country than in England, whilst the Chairman observed that the price of fruit had been going up year after year.

Mr. Grey pointed out that the Albany district grew now a great deal of fruit that it could not dispose of, and this would become worse in the future; that was what they were looking forward to, and wished to make provision for.

The resolution was then put and carried.

THE FRUIT FLY.

Mr. Flanagan submitted the following resolution from the Komgha Association: "Congress earnestly urges the Government to spare no effort to introduce as early as possible recently discovered parasites of the fruit fly in Brazil."

Mr. Mally gave an account of the discovery of the parasites, but said they had no evidence yet that they would live under the climatic conditions of this country. They must not expect too much until a trial had been made.

The proposition was seconded by Mr. Sansom and unanimously approved.

LOCUSTS.

On behalf of East London, Mr. Sansom moved a resolution urging the Government to make the destruction of locusts compulsory, and re-affirming the resolution passed at the last Congress that the only way of doing this was to take action when the insects were in the voetganger stage.

Mr. Pringle said where the locusts were in any great number it would be difficult for individual farmers to destroy them without assistance.

Mr. Maasdorp said that in the Albert district the Government had been giving out sprays and soaps at a third of the cost, whilst other delegates said there were swarms of locusts up-country just at present.

Mr. Goulden urged it was the easiest thing in the world to cope with the locusts if they had compulsory legislation. They should also re-affirm the decision of the last Farmers' Congress in favour of a conference with the other States in South Africa on the matter.

The resolution was agreed to, and it was resolved to also adopt the proposal for a conference of the other South African States.

UNIFORM BOXES FOR FRUIT.

Mr. Ulyate proposed to call the attention of the Government to the unsatisfactory return of empties by the Railway Department, and also to recommend the adoption of uniform size in boxes for the various classes of fruit properly branded.

Mr. Malleson said it was a good thing not to have empties returned if they wanted to keep clear of insect pests.

The Chairman did not think there was need to go in for uniform boxes in sending to the local markets.

Mr. Mally described returned empties as common carriers of insect pests, because they generally came from so many different places, and one did not always get one's own boxes back.

Mr. Grey pointed out that fruit fetched a much better price when packed in attractive boxes of a uniform size.

Mr. Ulyate withdrew the first part of the resolution referring to empties, and

Mr. Sansom having seconded, it was carried unanimously as amended.

FRUIT GROWERS' REQUISITES.

Mr. Sansom also moved a resolution urging that satisfactory arrangements should be made for the supply of fruit growers' requisites. He said what they really wanted was a depot for the Eastern Province.

The resolution was seconded by Mr. Warren, but on the suggestion of the Secretary, it was decided to leave the matter to the Board, and to urge associations to send in their indents, so that the goods might be obtained in time for the next season.

AGRICULTURAL COLLEGE FOR THE EASTERN PROVINCE.

Mr. J. W. Venables proposed a resolution urging the establishment of an agricultural college in the Eastern Province. He said they had realised the advantages obtained by young men who had attended the college in the Western Province, and they wished to obtain the same facilities in this part so that the Eastern Province might be developed to the full advantage.

Mr. Ulyate, seconded the propostion, and said the conditions that prevailed in the Western Province were quite different to those obtaining in the East.

The Chairman said he would like to see experimental stations established both for agriculture and horticulture.

Mr. Goulden said they should have the same facilities in this part of the Colony as in the Western Province. He believed a Government pledged to the development of the internal resources of South Africa, could not but accede to their wishes as soon as they were able to do so.

The motion was carried unanimously.

BLIGHT PROOF STOCKS.

In proposing that Government should be asked to introduce a Bill to prevent the sale of apple trees except on blight proof stocks of an approved variety, Mr. Venables said he was sure the resolution would commend itself to all fruit growers.

The Chairman said that such trees would not be proof against the American blight if they were brought in contact with it; it was only the roots that were proof against it.

Mr. Malleson did not think they would ever get such a Bill through Parliament. What they should do was to get a guarantee from their nurseryman that the apples they bought were on blight-proof stock.

Mr. Landrey asked if any reliable means had yet been found of stopping the spread of American blight.

Mr. Ulyate said that he had used "tick-oil" very effectively.

Mr. Malleson said he was now carrying out experiments with some stuff called "Strawsonite" which had been given him by Mr. Lounsbury. A good thing for checking underground blight was shredded tobacco laid on the roots, whilst tobacco wash was very good above ground.

The resolution was adopted.

FAILURE OF CITRUS TREES.

Mr. Fletcher, on behalf of Macleantown, submitted the following resolution:—With reference to the commission of enquiry into the failure of citrus trees, as reported in the *Agricultural Journal*, fuller information should be obtained by the commission on the subjects of root rot and Seville orange stocks. Too few fruit farms were visited for the conclusions arrived at to carry weight.

Mr. MacDermott suggested the probability that as the work of the commission was interfered with owing to the war, that might account for their not visiting more farms.

On this explanation Mr. Fletcher accepted the following resolution from Mr. Goulden:—"Seeing that the commission appointed to investigate the condition of citrus growing was interfered with, this congress is of opinion that such an important matter should receive further investigation."

Mr. Venables seconded the motion, and Mr. Mally also urged that further investigations should be made. They should have a plant disease man who would continue the investigations.

The proposition was adopted as was also another from Macleantown, urging that the Agricultural Department should send notice to the secretary of the Horticultural Board when experts or commissions were about to visit the Province.

PROPOSED TESTIMONIAL TO MR. LOUNSBURY.

Mr. Fletcher introduced the question of the propriety of presenting a testimonial to Mr. Lounsbury, the Government entomologist, for his services to fruit-growers.

Mr. Venables seconded the motion, referring to the eminent services Mr. Lounsbury had rendered to fruit growers.

Mr. Warren said Mr. Lounsbury had done a great work in the country with regard to insect pests, and it was only right that his great services should be recognised.

Mr. Landrey suggested the testimonial should take the form of a piece of plate suitably inscribed.

Mr. Goulden urged that the testimonial should be made worthy of Mr. Lounsbury and the Eastern Province.

Mr. Maasdorp moved that the testimonial should take the form of an illuminated address.

Congress having cordially expressed its approval of the proposed testimonial, Congress adjourned until 9 o'clock the next morning.

SECOND DAY, WEDNESDAY, NOVEMBER 23.

On Congress re-assembling the first business dealt with was that of the

Representatives on the Board.

This involved the revision of the constitution, and in reference to this, congress was asked to define the districts which are to be represented on the Horticultural Board, and on the motion of Mr. Goulden, seconded by Mr. Maasdorp, it was agreed that the Board should consist of representatives elected by each district in which fruit growers' associations exist, in addition to the President and secretary, who are *ex-officio* members.

Irrigation.

The question of irrigation was introduced by Mr. Goulden, who moved that Congress should express the opinion that Government should earnestly grapple with the subject of irrigation. He said the Government had taken a new departure and had decided that if Cape Colony was to fulfil its mission as an integral part of the British Empire its internal resources must be developed. They as fruit growers and farmers were pleased that the Prime Minister and the Government were recognising that agriculture was the backbone of the country. He favoured the idea of the Government assisting the individual farmer in the matter of irrigation rather than to go in for large schemes. They did not want a new Act, but they did ask that the present Act should be carried out in a reasonable and sensible way and released from the tangle of red tape that now surrounded it.

Mr. J. W. Venables seconded the motion, and

Mr. Pringle observed that he agreed with what had been said as to the trouble of getting money from Government for a dam. He urged farmers to take the thing in hand themselves.

Mr. Fincham said that if the Government lent money it had to be properly protected, and it was necessary that the work should be done in a workmanlike manner. For all that, he believed more could done in the matter by farmers themselves, and he suggested they should not think so much of going to Government but should put backbone into it themselves. Until they educated themselves and their children to do more for themselves the country would not prosper.

The motion was passed unanimously.

EXPERIMENTAL ORCHARDS.

On the question of experimental orchards, Mr. Fincham remarked that Government was neglecting their duty when they failed to establish experimental stations in the Eastern and Midland districts. The excuse for not doing so was always want of money, but money could be found for other purposes. He moved that they should impress on the Government the urgent necessity of establishing an experimental station in the Eastern and Midland districts.

Mr. Malleson seconded the proposition, which he said would be very heartily supported by the Western Province. They would save thousands of pounds by such experimental orchards, and at the same time they should also ask for the appointment of a thoroughly competent fruit growing expert (hear, hear).

Mr. J. W. Venables seconded the motion, which was adopted unanimously.

GENERAL BUSINESS.

Mr. Landrey moved that the minutes of the Congress should be written up each day, and be read and confirmed before the business was proceeded with the following morning, and that in the case of the last day's proceedings the minutes should be confirmed he same day.

This was seconded by Mr. Ulyate and agreed to.

Mr. Fincham also moved that in future the Congress should precede instead of follow the meeting of the Horticultural Board, which could then deal with matters that came before Congress.

Mr. Malleson said that this was the way the thing was worked in the Western Province, and it had worked very well.

The Chairman said it would be necessary still for the Board to meet before Congress as well as after.

Mr. J. W. Venables seconded the proposition, which was adopted.

Mr. Landrey expressed the opinion that a full agenda of the subjects to be discussed at Congress should be submitted to the Association three weeks before Congress met.

The Secretary said the suggestion was a most desirable one if it could be carried out, and if the Associations would only send in their subjects in time.

A motion to this effect was then carried unanimously.

ELECTION OF OFFICERS.

Mr. Fincham moved the election of the Minister for Agriculture for the time being as President. He said his object was to try and bring the east and west and other Horticultural Boards as closely in touch with each other as possible.

Mr. Landry seconded the proposition, which was carried unanimously.

Mr. Venables moved, and Mr. Fletcher seconded, an unopposed motion, that the constitution should be amended so as to permit of the election of a Vice-President; and this was allowed, Mr. J. C. Nelson being elected to the office on the motion of Mr. Flanagan, seconded by Mr. Sansom.

Mr. W. Goulden was unanimously re-elected Secretary, on the motion of Mr. J. W. Venables, the proposition being carried by acclamation, and a bonus of £25 was awarded to him in recognition of his services.

JOINT CONGRESS WITH THE WESTERN PROVINCE.

Mr. Malleson said he would like, before the Congress fixed the date of next meeting, to say that the Western Province would be very glad if they could hold with them a joint Congress at Oudtshoorn next May.

The Chairman pointed out that it would mean having another Congress in four months, and he suggested that perhaps the Board would hold its meeting there.

Mr. Fincham asked if it was necessary they should have their Congress in November.

The Chairman said it was found to be a convenient month.

Mr. Venables thought May would be a good month in which to hold the Congress. whilst Mr. Maasdorp thought they ought to accept the invitation extended to them by the Western Province.

Mr. Fincham formally moved that the invitation should be accepted, as such a joint Congress would be of the greatest advantage to fruit-growers.

Mr. Maasdorp seconded the motion.

Mr. Goulden pointed out that it was a question whether they in the Eastern Province could get away from their work in May, which was a month which suited those in the Western Province better than it did in the East.

Mr. Fincham said that was only a small point cempared with the importance of associating for the time being with the Western Province.

It was then agreed unanimously that if possible the next Congress should be held in May at Oudtshoorn at the same time as the Congress of the Western Province, but that should it not be possible to carry this out, the Board should decide on a place.

VOTES OF THANKS.

Before Congress closed, votes of thanks were passed to the Mayor and Town Council for the facilities given for holding the meetings, to the Chamber of Commerce and Harbour Board, and also to the *Daily Dispatch* for the publication of reports of the Congress.

In the afternoon the delegates were entertained up the river by the Chamber of Commerce, and an enjoyable afternoon was spent.—*Daily Dispatch.*

NATURAL ENEMIES OF THE FRUIT FLY.

By CHAS. P. LOUNSBURY, Government Entomologist.

Many fruit growers were doubtless perplexed by the allusion to Brazilian natural enemies in Mr. Mally's comprehensive article on the Fruit Fly in the last issue of the *Agricultural Journal*, for the story concerning these checks on the dreaded pest has not yet appeared in the Cape Press. For general information we give it here and make known what the Government is doing in regard to the matter.

Fruit flies are the greatest pest to fruit that we have in South Africa. The principal species, *Ceratitis capitata*, blows nearly all of our Cape grown fruits, though some kinds much more commonly than others. In some parts of the Colony few peaches escape the attack, and often most of the soft fruits maturing after about Christmas get blown. The pest varies in abundance from year to year, and, in general, probably owing to the greater prevalence of wild fruits, is worse in Eastern sections than in Western. Japanese plums appear to escape *C. capitata* altogether; but these fruits in Natal are attacked by another species, which at any time is apt to get to and spread about the Cape, and which probably is already present in the extreme east of the Colony.

The fruit flies that give trouble in cultivated fruits are presumed to be introduced pests, and they have no special natural enemies in South Africa as far as anyone has been able to discover. The original habitat of the chief species is in doubt, but it has become established in many warm temperate countries, and in time will probably find its way into all. The countries bordering the Mediterranean have suffered from it for nearly a century, if not longer; and it has long been found in the Madeiras and other Atlantic Islands. Peach growing for market is said to be impossible in the Bermudas on account of it. Very fortunately for them the American States are still free from it. It appears to thrive only in countries having little or no long continued frosts, so it is not expected to ever become a pest in England or northern European countries, or in the northern parts of the United States.

That such a pest as the Fruit Fly could be kept in suppression by parasites and predatory insect enemies in cultivated fruits has always seemed very doubtful to the writer. I have been inclined to view the pest as one which is injurious chiefly because it has chanced to be specially favoured by the changes from natural conditions which man has brought about through his improvements in fruits and in his growing them under cultivation. The changes, it has seemed to me, serve in a large measure to benefit the fly by giving it vastly more fruit to attack, and by giving it fruit with pulp that affords far better protection to the maggots from their natural enemies; and it has seemed to me that birds, spiders and various other forms of insect-devouring life must destroy a much smaller proportion of the flies and maggots in orchards than they do where the fruits grow wild. Therefore I have thought that fruit-growers must always rely chiefly on "artificial" as opposed to "natural" measures in fighting the pest. A few entomologists have been more optimistic, and have held that the fly must somewhere have natural enemies which if introduced into countries where it is a pest will lead to its subjection.

The fly became established in Western Australia a few years back, and the Government there, after doing its best to exterminate it, engaged an American natural enemy enthusiast to rove about the world seeking in what he thought likely countries for its presumed efficient natural enemies. This man, Mr. George Compere, is a master collector and observer of insects; and after long search in many lands, he finally, in May last, discovered the objects of his quest in Brazil. His report to his Government on the find is published in the August number of the *Journal* of the Agricultural Department of Western Australia. He says that he found in Bahia and elsewhere in Brazil as many as nineteen different species of fruit flies, including the one in which we are specially interested, and that he found the maggots of these preyed upon most voraciously by a certain Staphylinid beetle, and subject to parasitism by at least two species of Ichneumon wasps. At Bahia, which he says is called the "fruit garden of Brazil," and where he was the most successful, he found a wide variety of fruits attacked by the fly; but, he says in his report, "so little damage is caused by their attack that not a single person was met with during my stay in that district who had ever heard of or knew of such insects as fruit flies." To get supplies of the parasites to take to West Australia, he has recourse to covering a fruit-laden tree with mosquito netting and introducing therein all the flies he was able to catch; after a few days he removed the netting to enable the parasites to find the maggots which hatched from the eggs laid by the flies, and about a week afterwards he collected all the infested fruits. When he reached West Australia in July he had about two hundred fruit fly puparia infested with parasites, and a good number of the predaceous beetles. He is not sure of getting the checks established by these introductions, but he feels that should he fail with them, his Government has only to get further importations from Brazil, and he ends his report with the sentence: "Once these parasites and beetles become established in the State, there will be no more fear of *Ceratitis capitata* than there is of the most harmless insect in the country."

Mr. Compere's travels have been closely followed by official entomologists in South Africa for, however little faith any may have had in the ultimate success of his quest, it was fully realised that should he discover parasites of importance, the countries of South Africa might benefit greatly. The first intimation that he had found parasites came from Australian papers, in which was made public a brief cable dispatch from Brazil announcing the fact. As soon as the number of the journal containing the full report was received, and it was seen that the discoveries were evidently of considerable promise, Mr. Claude Fuller, the Natal Entomologist, suggested to the writer that some joint action should be taken by the several English colonies of Sonth Africa, and I agreed with him that such action should be taken without delay.

The Natal Entomologist and I believe ourselves justified in giving full credence to Mr. Compere's statements that *Ceratitis capitata* exists in Brazil, and that it is not a pest there. Neither of us, however, share Mr. Compere's optimism to the extent of being confident that his finds will anywhere effectively suppress the fruit-fly pest. We think there is some chance that, even if all is done that can be done to introduce and establish the checks in South Africa, they may fail to prove of any practical value. But, on the other hand, so vast would be the benefits if Mr. Compere's prophecy were fulfilled, and so good at least are the chances of materially improving our conditions as regards the pest, that we believe our Governments should lose no time in making a determined effort to get the checks established here. The Eastern Province Entomologist and the Orange River Colony Entomologist agree with us, but the Transvaal Entomologist is of opinion that we should postpone action until Mr. Compere proves the checks either a success or failure in West Australia. The writer is much opposed to delay, for it may take several years of experience to demonstrate in West Australia whether or not the checks are of material advantage, and even if a partial or complete failure follows there, we in South Africa may not be satisfied that attempts to establish them here would not be fully warranted. Despite my previous scepticism that efficient natural enemies exist, and despite my present fears that the checks found may by no means fulfil Mr. Compere's expectations, I am firmly of the opinion that it would be wrong for the South African colonies to delay a single season.

On the recommendation of the writer, the Cape Government has decided to give the matter attention this summer, and, acting on the suggestion made by Mr. Fuller, has asked the Natal, Transvaal and Orange River Colonies to bear a share of the expense. At the time of writing it is not known whether or not the last two colonies will contribute, but Natal has promised one-fourth of the necessary funds and has agreed that its entomologist, Mr. Fuller, accompany the writer on the mission. The plan of work so far arranged is that the two leave Cape Town on the fourth of January to join the mail steamer which touches at Madeira on January 18th on its route to Brazil. Mr. Fuller will spend a few weeks in Brazil and then return to Natal with all the parasites and beetles of the desired species that can be got together meanwhile. The writer will remain some time longer and make shipments of parasites as often as practicable in cold storage; and late in the season will return himself bringing further supplies. In this way it is hoped to get an abundant supply of material throughout the late summer when the pest is worst in South Africa. The task of rearing the parasites on this side of the water will be left largely to Mr. Fuller in Natal; and the object of his going to Brazil in the first instance is in part to get him thoroughly acquainted with the conditions under which the insects thrive in their native home so that he can treat them most considerately here. It is anticipated that Natal will prove a better place to start the parasites in the first place than any section of the Cape because of the never failing prevalence of the pest in the Garden Colony. It is probable, however, that some parasites will be liberated at the Cape near Cape Town and perhaps also near Grahamstown during the summer should it be found possible to get large numbers in Brazil, and should maggots prove abundant in those places this season. Mr. Compere believes that the Staphylinid beetle destroys even more maggots than the Ichneumon parasites, and found that the specimens which he took to Australia required daily feeding with fly maggots to prevent them from attacking and devouring one another. It is in part to double the chances of success in getting numbers of this beetle alive to South Africa that it is thought advisable for two entomologists to go.

The satisfaction that the fruit loving public is bound to feel with the Government for taking these decisive steps without the loss of a season should be shared by all growers of melons, marrows, cucumbers and the like. The crops of these vegetables in nearly all parts of the Cape are often injured to a very grave extent by the work of species of flies closely related to the fruit flies. If the checks to be introduced prove of any value for the fruit fly maggots, it is quite probable that they will also be useful against the maggots in the cucurbs.

Should South Africa benefit at all by these checks, the indebtedness to Mr. Compere will never be forgotten. In any case, all our farmers will admire him for his patient search of country after country until the object of his quest was attained. The credit of his discoveries appear to be due entirely to himself and the Government which supplied him with the necessary funds for his travels.

THE UTILISATION OF KAROO FLOOD WATER.

Mr. Southey's Success at Schoombie

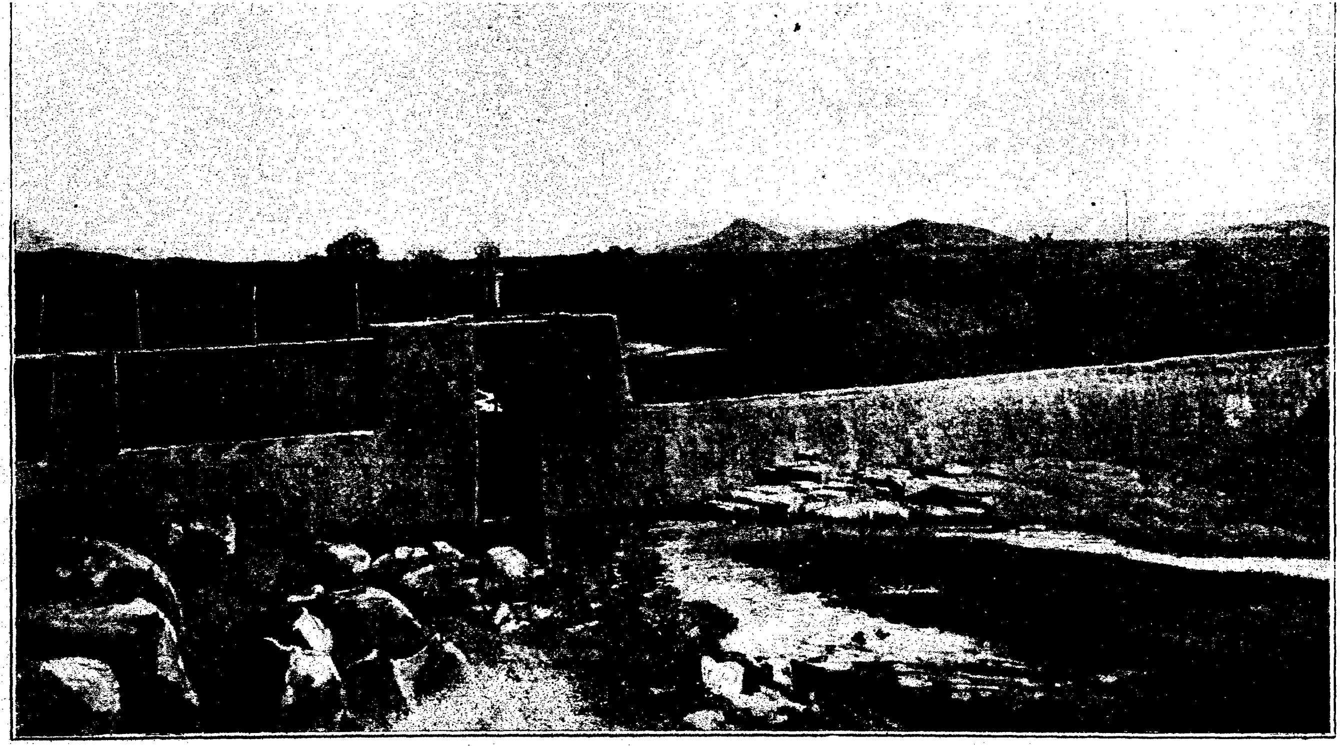
Ever since the publication of the paper read recently before the Cradock Farmers' Association by Mr. W. R. Southey, describing the valuable work he has accomplished on his farm Varkenskop in utilising storm water for irrigation and flooding the veld, we have been urged from many quarters to give further details if they were obtainable. We are now in the fortunate position of being able to comply with these requests, having paid a personal visit to the property recently, and secured some photographs, taken after a drought of over four months duration, of the works and other items of interest. These, supplemented by reduced copies of the plans made by instruction of Mr. Gordon, the Director of Irrigation, and some notes supplied by him, should give our readers a fair idea of the magnitude and effectiveness of the whole scheme.

The farm Varkenskop, situated within a couple of miles of Schoombie Station, on the Rosmead-Stormberg line of railway, is, as many are aware, in a belt of country subject to severe droughts. The soil is similar to that of most of the Karoo, being plentifully supplied with lime, and lying fairly deep over a large extent of level ground, with a few kopjes to break the monotony. The usual Karoo bushes form the staple stand-by for grazing, but in wet seasons, and whenever water can be put on the soil, natural grasses spring up thick and strong, and furnish a goodly crop for grazing.

There are two rivers on the farm, the Brak and the Rooi Spruit or Klein Brak River. Though nominally perennial streams, the flow is very slight, except in those favoured spots where strong springs keep up a fair supply.

The Brak River has its source in the Zuurberg Range at a point about 25 miles to the north of Varkenskop farm. Before reaching the farm it receives the drainage of about 300 square miles of country. The upper and hilly portion of the catchment receives, in all probability, the heaviest rainfall, but there is no record of its amount. During the past six years, however, amounts varying annually from 8·3 to 17·5 inches have been recorded at the farm itself. In a year of ordinary rainfall the river comes down in flood about eight or ten times. Indeed even in 1903, when only 8·3 inches were recorded at the homestead, the river came down on eight separate occasions.

Measures for utilizing the flood water of the river were first put in hand by Mr. Southey in 1876. In that year he constructed a weir



No. 1 Weir, showing sluice gate for washing out silt, &c.

(No. 3 in the plan) across the river opposite the homestead for the purpose of diverting the water over the land on the right or western bank of the river. The channel here has a bed width of 40 to 50 feet, and it flows 10 feet deep in an ordinary high flood, rising to 20 feet in an extraordinary flood. The longitudinal slope of the bed is about 17 feet per mile. The weir is a solid masonry wall protected on either flank by masonry wings, that on the right flank being provided with a sluice, five feet wide, for regulating the supply to the canal. The crest of the weir is 72 feet long; its maximum height above the bed of the stream is 12 feet. The wings on either side rise 6½ feet above the creek.

Weirs No. 1 and 2 were subsequently constructed—the latter in 1893 and the former in 1902. These store up water for the irrigation of lands near the homestead besides affording a supply of water for general use on the farm. The water which they store during every flood is augmented by a spring which rises about 1½ miles above weir No. 1. Like No. 3 these weirs are constructed of solid masonry; but instead of being provided with masonry wings on both banks each weir has its crest wall prolonged well into the bank, thus offering less obstruction to the free passage of a high flood.

From weir No. 2 a channel, six furlongs in length with a bed width of 15 feet, has been excavated to carry the flood water over the lands on the left bank. From the same weir a smaller channel conveys the stored supply to the perennially irrigated lands (about 75 acres) adjoining the homestead. From this channel Mr. Southey is now constructing a small branch furrow with the object of extending cultivation to the north of the homestead.

The Rooi Spruit or Small Brak River enters the farm at its north-western corner, after draining an area of about 250 square miles. Across this spruit, Mr. Southey, in 1895, constructed a masonry dam which diverts the flood waters over the veld and stores sufficient water for the irrigation of about 50 acres of lucerne.

The flatness of the ground adjoining the river is a feature of the farm which has greatly facilitated the utilization of the flood waters in the manner adopted by Mr. Southey. This is exceptionally noticeable on the right bank of the river, where, in some long stretches, the surface of the ground slopes at the rate of only 3 feet per mile. This is an unusually small slope to find in any large tract of this Colony, south of the Zuurberg range.

The total area covered by the diverted flood water, available from 550 square miles of catchment, is, according to the plan about 6,000 acres. This is an extremely good record even if the whole area is not flooded every year.

A Ride Round the Farm.

Having had a good look round the irrigation works the next thing to do was to take a ride over the farm. This was no light task for altogether it extends to some 9,000 morgen (upwards of 18,000 acres) nearly all of which is carefully fenced off into paddocks for grazing, and enormous stretches of lucerne. Starting from the house

No. 2 Weir, showing the river dammed for irrigation work

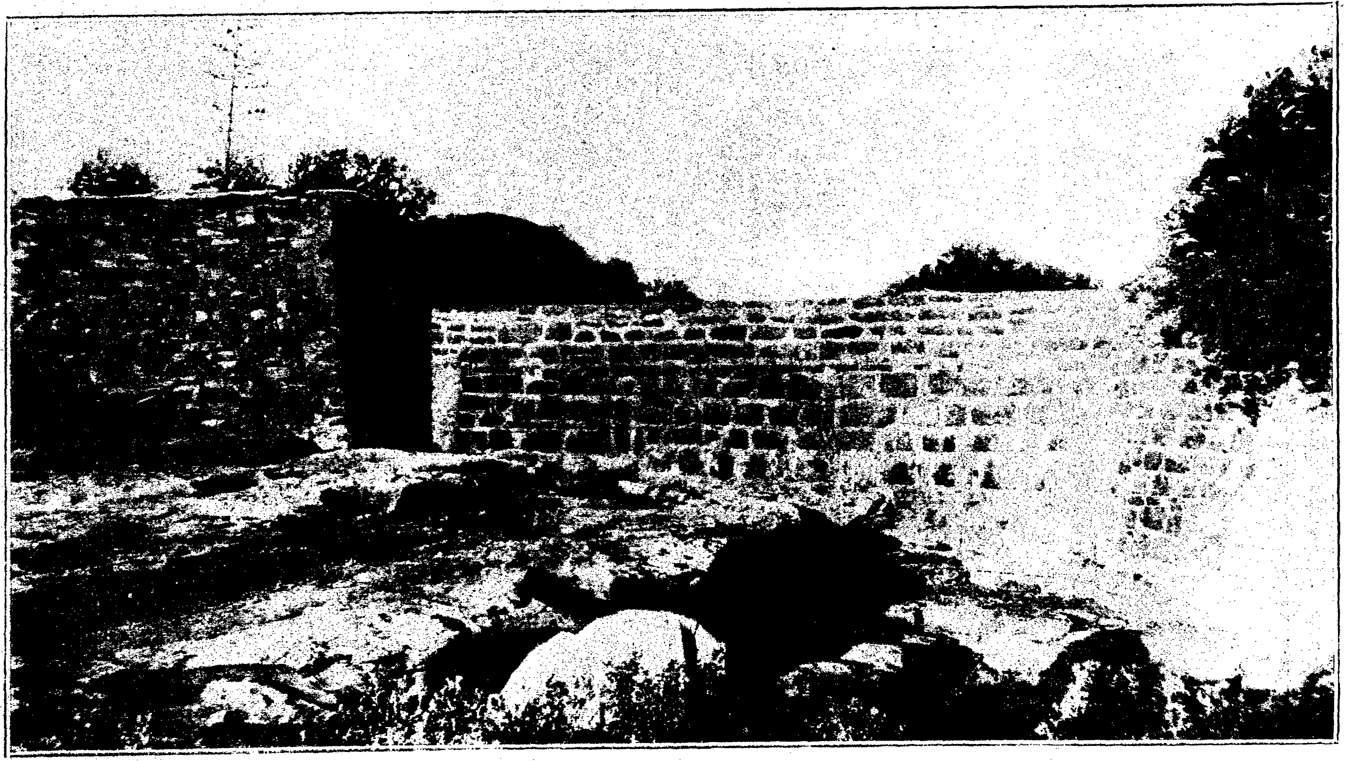
which is a handsomely built modern structure of stone, roomy and comfortable to a degree, we rode in company with Mr. Southey first through a thick belt of fruit and timber trees which shelter the homestead then through the lucerne paddocks following the course of the Brak River until we reached the lower boundary. Everywhere one looks, the one main objective—the conservation of water,—is the prominent feature. With this is closely associated another object, that of the prevention of erosion and wastage of soil by sluiting.

Almost as much work has been done by Mr. Southey in this direction as in that of utilising the flood water. The level nature of the farm assists a good deal in this work but there are signs everywhere abundant that had it not been for the care and forethought exercised on so large a scale the turning of the flood water over the farm might have been productive of more harm than good. Mr. Southey's methods are very effective. He catches the flood waters in the bed of the river and diverts them in an even flow on to both banks. By doing this he obtains a valuable deposit of silt with every flood which acts as a fertiliser, for as the water subsides the silt is left in the form of a layer of fresh soil. Every channel likely to develop into a sluit is carefully stopped by means of low stone and earth banks and where there is a likelihood of a stronger flow than usual Mr. Southey anchors the stone work down by means of stout fencing wire closely laced over it. The result is that even in a drought such as that which has held the district in its grip for months past everything looks green and flourishing at Varkenskop. The lucerne lands, of which there are 120 acres, are kept supplied from the water collected behind No. 2 weir shown in the illustrations herewith. No. 1 weir serves the purpose of throwing the flood waters across the veld. No. 2 acts as partly storage and partly the same as No. 1, while No. 3 serves the same purpose as No. 1 by turning the flood water through broad channels on to the lower lying lands. These lower lands produce enormous quantities of tall rich grasses in flood times much of which is hayed and kept as a stand-by with the lucerne for the times of scarcity.

There are a few fairly strong springs in the river which keep the stream alive. These are used for stock drinking purposes principally.

The water for the Homestead and gardens is brought through a furrow from weir No. 2 to a point near the house where it is pumped up by a wind-mill to a delivering tank. By this means pressure is gained with the result that the house is fitted with shower baths and the garden with fountains which splash and play with refreshing vigour on the hottest days in summer. A Karoo garden with fountains in full play is an ideal conception which few could improve upon.

At the other end of the farm where the Little Brak River comes in, Mr. Southey has also done some extensive work and leads his furrows for long distances to bring the water on to his lucerne, and, not content with the natural flow of the stream, he is now carrying on



No. 3 Weir, for spreading the floods over the low lying lands.

the laborious task of cutting through the limestone bed of the river of to a depth of some feet in order to increase the flow. The best of it is that he is succeeding and hopes to do even better in the future. The flood waters affect some 3,000 morgen, and Mr. Southey has been engaged on these works for 30 years.

The extent of the farm is some 9,000 morgen, and a good part of it, north of the railway, is above the line influenced by the floods. This property has carried at one time as many as 400 ostriches, 800 cattle, and 3,000 sheep. Just now Mr. Southey has been reducing the number of cattle, but he still runs a large herds of pure bred Devons, and his dairying output is considerable, even in a drought. He has a couple of hundred cows in full milk, and ample grazing for all. The huge stacks of grass and lucerne hay dotted about speak volumes for the foresight of the farmer.

To complete this article we cannot do better than reproduce the paper read by Mr. Southey at the Cradock Farmers' Association, under the title of

FLOODING THE VELD—A REMEDY FOR THE RAVAGES OF SLUITS.

Mr. Southey then said:—

It is now over thirty years since I settled down to farming in this dry country, the Karoo. One of the first things that struck me was the value all farmers, who had been living for a long time in the Karoo, placed on what are called vleis, that is land flooded by flood water.

It was my good fortune to start on a farm possessing a vlei, which enabled me to judge of its value compared with the outside veld not under flood water. There was simply no comparison; not only did the vlei carry six times the number of stock, but kept them in far better condition. I also noticed wherever flood water after rain ran from a sluit or river on to a piece of level land, that land so flooded became vlei.

THE EVIL OF SLUITS.

While travelling in different parts of the Karoo, I came across many farms cut up by deep sluits running through beautiful level ground, and was invariably told by the owners that in former years, where those sluits now are, there used to be fine vleis, but since the sluits had washed through, the vleis disappeared, and the farms in consequence could not carry the usual quantity of stock, and therefore had decreased in value.

I also came across men thirty years ago, who at that time were over eighty years of age, who told me in their young days they had lived along the Brak, Thebus, and other rivers. I gathered from them that when they first knew that country, instead of rivers (dry sluits we might call them to-day), there used to be large vleis covered with a mass of thick grass, reeds, rushes in qualities good for all kinds of stock. The spring waters, now running twenty feet and more below the surface, at that time could be turned out on to

Stable and Farm Buildings

the lands with a spade in a few minutes, to-day we have to build weirs 15 and 20 feet high to bring the water to the surface.

What has brought about this great change for the worse? Neglect, and nothing but neglect. It is the nature of animals when moving about to follow one another in foot paths, thus wearing away the soil, and in time forming a small sluit. Each time the vlei is in flood this sluit increases in width and depth till at last it becomes what is now called a river, draining the water which at one time used to flow over the vlei and is ultimately emptied into the sea. Consequently, the vleis disappear, and we have instead, a dry sluit. This has been going on from the time the first settlers started farming in the Karroo. The work of destruction is growing rapidly all over South Africa, fountains are becoming less in number and weaker. We might ask ourselves why? The answer is, because the flood waters after rains, instead of remaining and soaking into the land, are carried at a rapid pace by narrow channels to the sea; anyone with a grain of common sense must see this at a glance. Consequently, it should be put a stop to, where practicable, and the country so drained put back, if possible, to what it was over a hundred years ago.

"TO DO THIS WE MUST DAM THE COUNTRY."

No water should be allowed to flow into the sea that can be prevented. There are great difficulties in the way, and I fear in most instances the damage that has been done through the neglect of others, before our time, is irreparable; but, nevertheless, let us be up and doing. We must put our shoulders to the wheel and try, wherever practicable, to stem the tide of destruction. One sluit to-day means larger and more sluits a few years hence, and if this is allowed to go on, what will be the consequence after another hundred years? South Africa, instead of being a country worth living in, will become a howling wilderness. Flooding the veld means more grass, more stock, more money, and prosperity to the country, bringing with it pleasure and comfort to those living in it. It has been said, "The man who could make two blades of grass grow where one grew before, was a benefactor to his country." What will be said of those who make millions of blades grow where none grew before?

Well, gentlemen, you will begin to think it time I brought this lecture to a close, and gave you some of my personal experience in the utilisation of flood waters. I was fortunate enough to tumble on to a spot, I may say an ideal spot, for the utilisation of flood waters, and although I have not done, I have accomplished a good deal. I had no sooner set foot on the land than I at once noticed its great capabilities for

FLOODING THE VELD,

and at once started putting it into operation, at first, on a small scale. I had a great deal of uphill work to contend with. Neighbours who could not see what the result would be, imagined I was going to ruin their farms, instead of increasing, as I tried to persuade them, their value. The first thing I did was to stop the sluits that were already running through and draining my vlei, and in a year or two these sluits completely disappeared, and the vlei, not only much improved, but doubled in size, the waters spreading on to my neighbours' land as well as my own. Well, gentlemen, I went steadily on, year after year, not only filling up sluits, but spreading the water, heightening furrows. The more I did, the more I found I could do, and the more I felt inclined to do, seeing the benefit derived from what had already been done. At first when forming new vleis, there may be some disappointment; the first effects being to kill the bush and produce no grass. Some who had seen the effects said . "he had bushes, but now he has neither bushes nor grass," and ridiculed the idea of attempting to make vleis. The second year grass began to appear, but it was an inferior grass, a common garden grass. The third year the proper vlei grass put in an appearance, and as year after year went on, this vlei grass increased and thickened out till scarcely an inch of ground could be seen where there was only bush before with large bare patches between; and to-day this flooded land is ten times the value it was before flooded; and as time goes on it will increase in value for the simple reason that after each flooding, fresh rich soil is deposited, the grass increasing in quality and

Devon Cow "Cowslip," sire Master Harry 2073 dam Lady Cowslip Imported by W. R. Southey, November, 1904 First and Champion Dairy Cow at Honiton, Devon, in 1899.

quantity. I am unable to say what quantity of land I have under flood water, but it is a large extent of country.

GROWING LUCERNE UNDER FLOOD WATER.

With regard to growing lucerne under flood water without permanent water, my experience has been that where suitable land, fairly level, is to be found, lucerne can be very successfully grown, in fact some of my best crops of lucerne have been grown in this way, but I found great difficulty in mowing the crops, as invariably the river came down as soon as I had started, consequently keeping it unfit for mowing, and remaining wet for a month at a time; in such circumstances it is necessary to build in sluices to shut off and have complete control of the water.

STRENGTHENING OF THE FOUNTAINS.

As to strengthening of fountains by the flooding of the veld, I may mention that my flooding on so large a scale has strengthened fountains which rise in the bed of the Brak River very considerably for a distance of some twenty miles, and I have been told by the owners they can always tell when I have been flooding the veld, by the increased strength of their fountains.

CARE IN SELECTING SITES.

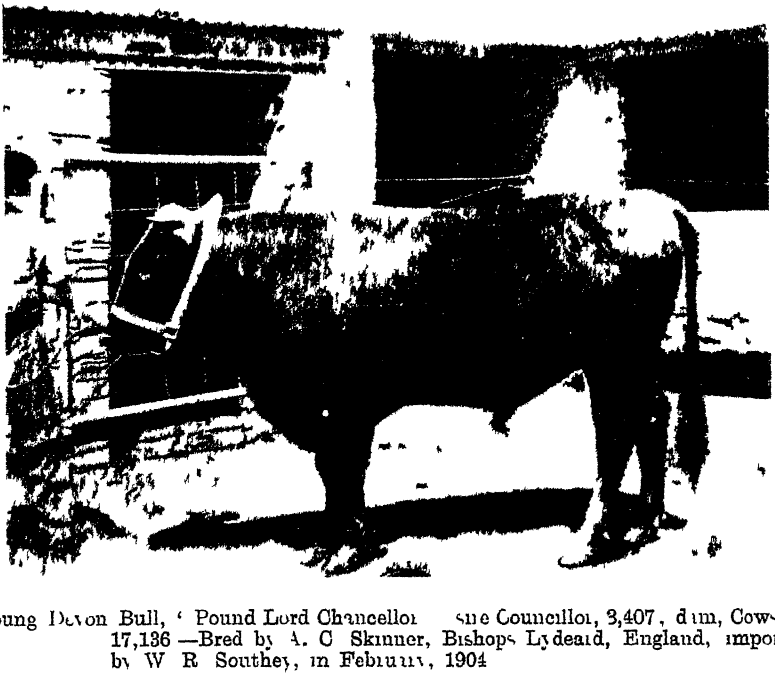
When choosing suitable spots or sites for erecting weirs for flooding purposes, great care should be taken to prevent disappointment or failure; a little common sense with an accurate eye for judging levels is essential for finding the best spots. Naturally, spots should be chosen, *if to be found*, with a good solid foundation and solid banks on each side, these spots are generally found where dykes cross the river, but as a rule, only one side is found solid, and of course, in some instances, both sides may be composed of soft soil; in the latter case, retaining walls or wings must be built to prevent the water which should flow over the weir, eating out the sides. The wings therefore should be built sufficiently high and extend in such a way as to keep the water from going round or over the sides and thereby changing the course of the river. It is well to bear in mind "what is worth doing is worth doing well," more especially does this apply in the building of weirs in rivers which after long intervals of drought, come down rapidly with great force which is very trying to all masonry. The land chosen for flooding purposes should be as level as possible, the more level the land the sooner it will become vlei. The rich silt brought down by the water instead of being carried away, will be left to deepen and enrich the soil, causing a more rapid growth as well as a richer and more fattening food.

CONSTRUCTION WORK.

Where the land is not very level, cross cuttings should be made (a sort of bank and ditch furrow) to convey the water on to more level ground, leaving small outlets here and there for watering the intermediate land as it goes along. Where sluits intercept they should be stopped, if possible; if not possible. be headed off with bank and ditch to convey the water into one or either side where suitable ground is available.

In constructing furrows or channels for conveying flood water on to the land, the size must be calculated in accordance with the amount of land suitable for flooding, as well as the lay of the land. Level land will take more water, whereas sloping land would cut up into furrows and wash away the soil.

As regards the building of sluices, what I have found to act most successfully are iron sluices (the thickness of plate should be in comparison with the size of the sluice required). Instead of an iron or wooden frame, grooves should be cut in stone, half an inch deep for the sluice to slide in; if carefully cut and properly fitted when building, with a level bottom of cement for the sluice to rest on, it will neither stick nor leak but work easily and freely. For raising or lowering the sluice, a rod with square cut screw with capstan wheel is best. This will lift or lower the sluice as required, with ease, even should the river be in flood with great pressure against it. This may appear a small matter but I can assure you it is of great importance and should not be lost sight of, for, as I have already said, it is most essential to have control of the water.



Young Devon Bull, ' Pound Lord Chancellor sire Councillor, 3,407, dam, Cowslip, 17,136 —Bred by A. C Skinner, Bishops Lydeard, England, imported by W R Southey, in February, 1904

For flooding purposes the gradient in the furrows should be sufficient to carry the silt but not so great as to wash out or deepen the furrows. Where the latter cannot be avoided, a stone and wire dam at the outflow will be of great assistance; where this is done the sides should be protected to prevent washing round. In cases of long furrows with little fall, it will be necessary to have flushing sluices to scour out at right angles; for this purpose suitable spots should be chosen with as much fall as possible. The flushing sluice can be opened when there is water to spare and will save a deal of manual labour.

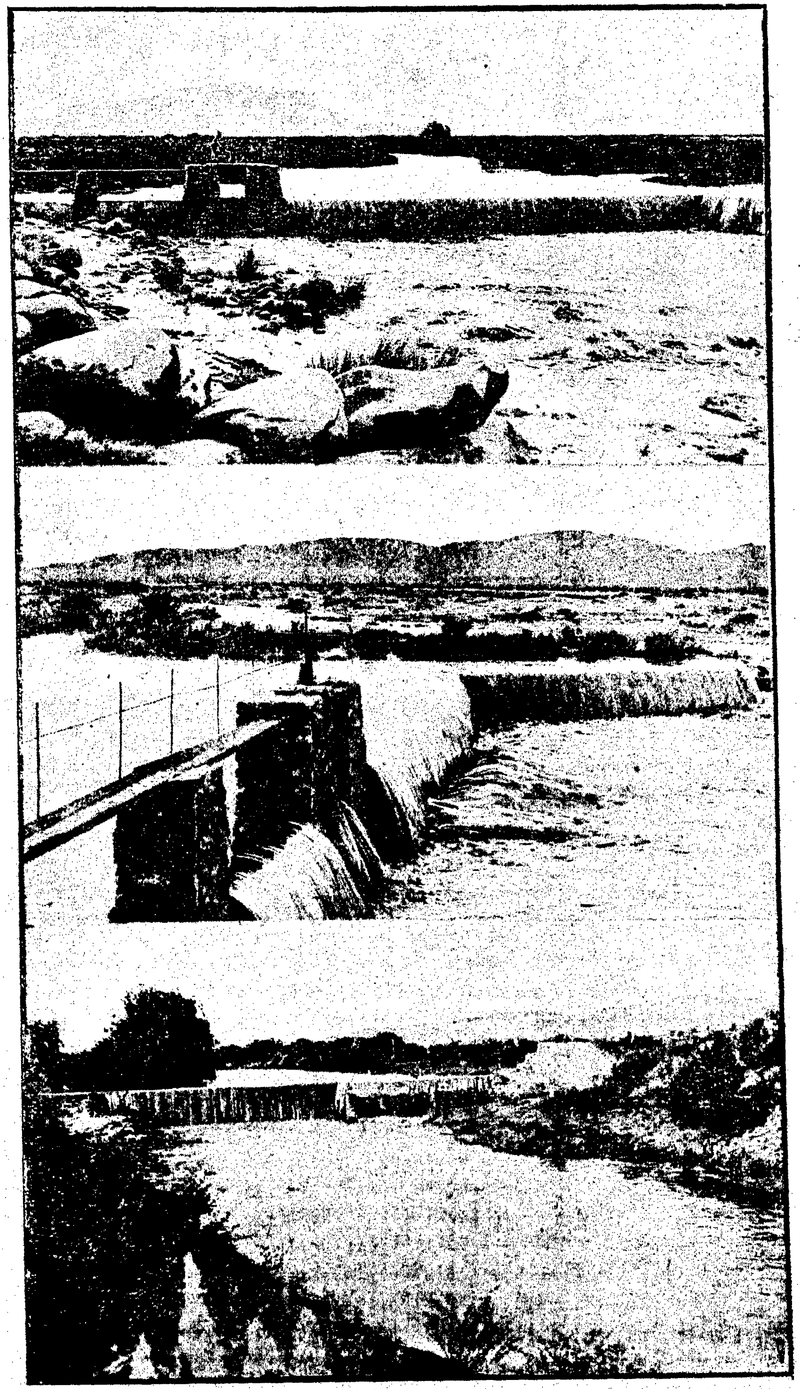
FLOOD WATERS FOR IRRIGATION.

Flood waters can also be used for irrigation purposes by storing in the beds of rivers if suitable spots can be found, by building a weir across the river as high as the banks will permit, with a sluice as already described acting as an outlet for the sluit. When the river is in flood the sluice should be drawn up to its full extent and after the silt has washed through, and the river is subsiding, the sluice can be closed down and by this means the river is converted into a catch dam retaining a large supply of back water. The longer and more level the bed the more water will be held back. A bridge should be made of two nine inch deals bolted together and run from the bank to the sluice as a crossing above high water for the purpose of drawing the sluice when the river is in full flood. I mention this as some of you who have suitable spots may feel inclined to give it a trial.

THE MATERIALS.

I believe our progressive Government are going to carry cement and irrigation material free; consequently it may be cheaper to use cement in place of lime (cement is preferable to lime if not too dear). Cement if good should be used, adding from four to eight of sand to one of cement. It is essential to use good clean sand, no dust. Where clean sand is unobtainable it should be washed through a seive, retaining only the grit. For building weirs I would recommend four or five to one cement. For wing walls outside, six to eight of sand to one would be sufficient. Where lime is used in beds of rivers take two to one for outside work, two-and-a-half or three to one, according to quality of lime. Where lime is used it is a good plan to point up each day's work with cement mixed four to one, this will prevent the lime from washing out; cement setting in a tenth of the time. In case of rain should there be sufficient warning of the river coming down, I have found a thin layer of cement plastered over the unfinished work, a great saving, the water passing over the top without doing any damage.

In the making of large flooding furrows I have found the quickest and most economical way is to use a plough and small iron scoop without wheels where the ground is not too stony. Should the furrow be a shallow one, it should be made wide, throwing the ground on the lower side to raise the bank as high as possible; I would then recommend the planting of American aloes to prevent the bank from being trampled or washed.



Views of the Weirs when the Floods are out.

IMPORTED SAXONY MERINO RAMS.

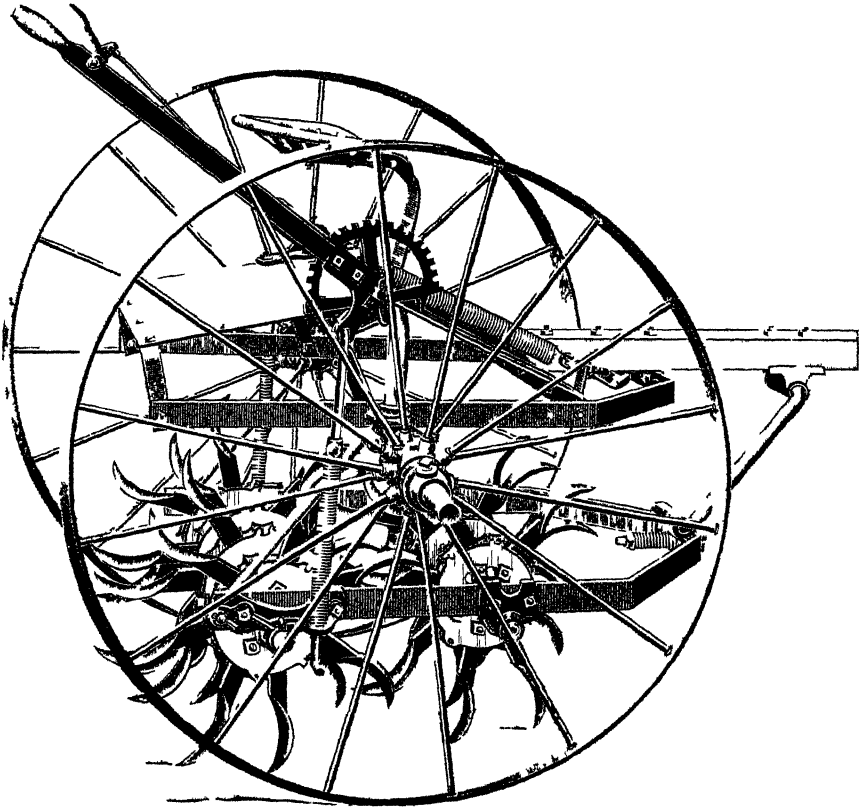
The German steamship Flensburg, ex Hamburg, discharged at the Table Bay Docks recently a shipment of pedigree Merino rams, to the order of Mr. R. Muller, of Strand Street, Cape Town. Mr. Muller has lately been travelling on the Continent, and upon his instructions six selected rams, from the stud farm of Thal, near Oschatz, Saxony, have been sent out to the Cape as an experiment. The stock are all carefully branded with their numbers and the name of the farm, and are all aged two years and seven months, except one, which is a month the junior of the rest. The farm is celebrated in the kingdom of Saxony for its fine stock, medals and diplomas having been awarded to its products in Saxony, England, Paris, Leipsic, and Brunwick.

The rams weathered the voyage in splendid fashion, and, upon being taken out of the ship, appeared to be full of life and energy. They are a sturdy set, looking in the pink of condition and having fleeces short, it is true, because the sheep were shorn before being shipped, on account of the passage through the Tropics, but of remarkably fine texture. Two of the animals have practically been disposed of to farmers in the Eastern Province, and as an inspection of the stock has been promised by farmers in the Caledon district, it is thought that the remainder will soon be disposed of. These Merinos are noted for growing wool of excellent quality, with long staple, and well-marked serrations, just the kind of silky stuff that the buyer likes to pick up, but only too rarely succeeds in finding in this colony.

Mr. G. A. Meyer, manager of Mr. Muller's produce and wool department, in the course of a conversation with a representative of the *Cape Times* stated that from his experience of this colony, more especially as a wool-buyer, who has had many opportunities of studying the wool question, he had not the slighest doubt that rams of this kind were just what the farmers of the Cape require. The merino had proved a decided success here; it had shown itself admirably fitted to deal with the peculiar conditions of the country. and had given good results wherever it had had a fair trial. Hence, with such fine blood stock as this from Saxony, strong, healthy fellows, with fine lustrous fleeces, he had not the slightest doubt that, with reasonable care and intelligent management, a vast amount of good could be done in the way of improving the quality of the wool grown here. In the Caledon district, where he had lately spent a good deal of time, he was convinced that fresh blood, of a fine type, needed to be introduced in the flocks. The farmers were fully conversant with the fact too; indeed, frankly admitted that that was so, and told him they would welcome the opportunity of getting fresh blood among their sheep. "Now, said Mr. Meyer, "that opportunity is given them, and we shall see how far they will embrace it."

A NEW LUCERNE CULTIVATOR.

Of recent years the special attention of South African agriculturists and others has been directed to the profits accruing from the growing of lucerne, but hitherto one of the great drawbacks has been the want of an efficient implement for cultivating the ground for that plant. Many implements have been put on the market as adapted for that purpose, but unfortunately on being put to a practical test they have in one way or another not quite fulfilled expectations. Many of the Cultivators are suitable in other ways, for tilling hard ground, &c., but they have been found to be wanting when applied to lucerne cultivation, by reason of their tearing up the roots of the plants, which, of course, should not be the case. We are therefore pleased to be able to put before our readers an illustration of a Lucerne Cultivator which it is confidently claimed answers the purposes for which it is intended, and from the particulars supplied we are inclined to believe it will prove a most suitable and reliable implement for lucerne growers.



It is not a heavy cumbersome implement depending upon its weight alone to secure penetration but by spring pressure a uniform depth of digging is accomplished. It is amply strong, being constructed of steel and iron of the best quality. The picker frame is held parallel with the ground by means of a yoke that connects the front end of frame and pole and two rear yokes that attach to the axle. The pickers are of a special grade of hard steel, drop forged and of perfect shape for their work. They have freedom of motion and will not clog, the clogging which occurs in ordinary diggers being prevented by an opening at the side of each tooth, which permits the loose soil to escape instead of packing in at the front and rear and obstructing the free swinging motion of the teeth. The cushion spring and low hitch protects the team from any shock. The wheels are 19 inches in height and have staggered spokes and removable boxes. There is a comfortable seat for the driver and a short steel top is provided to guard against the possibility of falling upon the diggers. On account of the lifting spring little effort is required to raise the heads. The implement is known as the Moline Lucerne Cultivator.

We are informed that some time ago the construction of a similar implement was conceived by an enterprising farmer in the Middleburg district, but the idea was never carried into effect and no patent was taken out. In the meantime one of the leading Agricultural Machinery firms in South Africa had been busy devising and perfecting a Cultivator adapted for Lucerne growers and the result was that some time ago the perfected and up-to-date Digger here illustrated and described was brought out and we trust that it will meet the peculiar requirements of lucerne cultivation. We understand that the Machine is already extensively used for the purpose in other countries and with the greatest success.

We are indebted to Messrs. Malcomess & Co., of East London, for the electro illustrating the Moline Lucerne Cultivator.

WEATHER FORECAST.

The forecast prepared by Mr. D. E. Hutchins, Conservator of Forests, regarding the rainfall that may be expected during the ensuing summer season in the eastern districts of Cape Colony, the Transkei, Natal, Orangia, Basutoland, the Transvaal and Rhodesia—in fact the whole of South Africa watered by the summer rains coming from the Indian Ocean and published first in the *Cape Times* is attached hereto. Those who are interested in the origin of these summer rains should turn to the note given by Mr. Hutchins in our issue for July, 1903, entitled "The Rain Winds of South Africa." It will be recalled that there was a controversy in the columns of the *Midland News* between Mr. R. S. Pringle and Mr. Edgar H. Rex Evans regarding the origin of the rain winds of South Africa, and the matter was referred to Mr. Hutchins's decision.

The important point to note with reference to these forecasts is that they are founded mainly on information supplied by the Indian Government regarding the weather conditions prevailing at the time in the Indian Ocean. This information has been supplied regularly by the Indian Government to Mr. Hutchins since he was able in 1896, to give a warning regarding the famine impending in that year, that warning being based on the failure of the summer rains in South Africa and the connection, which, at that time, was not much believed in, between rains in South Africa, the Indian Ocean area and India. In the forecast for this year the author shews how very close has been the connection between the Indian monsoons and Cape seasons during the last twelve years. It is to the character of the season that mainly depends the success or failure of farmers' crops, and we are happy in this connection to express the acknowledgments of South African farmers to the Indian Government for the information which they have so regularly and courteously supplied to the Conservator of Forests. This information is gathered at great expense by the Indian Government through the instrumentality of the Indian Meteorological Department which is one of the finest organizations of its kind at present existing. But the expense of this information is insignificant compared to the important issues involved, viz., the crops and wealth of a country with a population of 300 millions. The Indian Government spends £22,000 yearly on Meteorology: the Cape Government £800.

There are two points in connection with these forecasts that have to borne in mind. (1) They have no absolute value, but they give an indication of the character of the season that is to be expected, which is of the first importance to the Government of India when it has to face the terrible issues involved in an impending famine. The second point to remember in connection with long period or seasonal forecasts is to carefully distinguish them from the daily weather forecasts prepared by the Meteorological Departments in most countries. These are of a much more accurate character than the long period weather forecasts, since they depend on weather movements which the Meteorologist has ascertained is already advancing upon us. To the man in the street who wants to know whether it is going to rain to-morrow the daily weather forecasts have a personal and peculiar interest; but to the farmer, except at sheepshearing or harvesting time, they are not so important as the seasonal or long period forecasts. The short period daily weather forecasts have been brought to great perfection in the United States of America and in Europe. They are chiefly important in higher latitudes than South Africa, for it is here that the daily weather movement, the barometric depressions and anti-cyclones are best developed. Nevertheless, daily weather forecasting could certainly be undertaken with advantage in Cape latitudes during the winter season, and we may hope that when the Meteorological work of the Colony is better supported this will be done. South-West Australia, which has climatic conditions almost identical with those of Cape Colony, has had daily weather forecasts for some years, and it is claimed that a good percentage of its forecasts are successful.

Mr. J. R. Sutton, the well-known Meteorologist at Kimberley, in his paper on South African Rainfall (Trans. Philosophical Soc., December, 1923) has given mean figures for South African rainfall for the period, 1880 to 1901.

Regarding the origin of the summer rainfall of South Africa Sir John Eliot observes :—

"I have examined the rainfall charts of South Africa given in Bartholomew's "Meteorological Atlas," and they certainly indicate to me that the aqueous vapour, the condensation of which gives rainfall to the eastern half of South Africa, is brought up by air movement from the Indian Ocean, and occurs as a summer precipitation. Hence, so far as I can reasonably judge, the area forms a part of what I have termed the Indo-oceanic region. I might add, that rain in certain parts of India during the south-west monsoon chiefly occurs with easterly and north-easterly, and even with northerly winds. But these facts have not yet been utilised by anyone to prove that the rainfall is not brought up from the adjacent seas and oceans by the south-west monsoon circulation."

Sir John Eliot adds a table showing the close connection between the Indian and South African rainfalls during recent years. Slightly corrected to show summer rainfalls only, Sir John Eliot's table reads as follows:

Period of general excess of rain.			*Period of general deficiency of rain.*		
Year.	Percentage variation summer rainfall.		Year.	Percentage variation summer rainfall	
	India.	S. Africa.		India.	S. Africa.
1892	+12	+ 6	1895	− 5	+ 3
1893	+22	+32	1896 (famine)	−12	+ 2
1894	+16	+ 3	1897	normal	−26
			1898	+ 1	+ 7
			1899 (famine)	−27	−11
			1900	− 1	−18
			1901	−10	− 2
			1902	− 5	− 7

Nature, Nov. 3, 1904.

The remarkable connection between Indian and South African rainfalls during this period is discussed in Mr. Hutchins's forecast.

It will be seen too from these figures that, like Australia, South Africa has just passed through a period of drought. This droughty period is now breaking up. In Central Africa the heavy rain and good seasons have already set in. In the lakes of the upper Nile the water level has been falling from 1896 to 1902. Since 1903 it has been rising. It will be noted, too, that the cyclical indications for Cape Colony are favourable for the next three or four years.

For this summer the forecast is a general and complete break-up of the drought with good rains over Rhodesia, the Transvaal, Orangia, Basutoland, Natal, Transkei and the East of Cape Colony. In the Cape Peninsula and South-west there will be a return to the strong south-easters of six or eight years back.

There is little to predict with regard to next winter's rains in the Cape Peninsula and South-west of Cape Colony.

Mr. Hutchins's forecast indicates the possibility of a temporary set back in the break-up of the drought. There has been a bad Nile this year, and the Indian monsoon rains set in late. Since the forecast was written the following has been received from Cairo:—

"Conditions throughout the summer have been those of high atmospheric pressure and unfavourable to rainfall. In July only did pressure fall and fair rains fell at the end of June and during July. At the beginning of August with a return of pressure above normal, rains almost ceased in Abyssinia, and the Blue Nile fell two metres in fifteen days. It recovered partially only, and September rains also were poor. October conditions were those of pressure above normal, and therefore late rains were also poor, so that the low stage of the Nile is likely to be much below the average."

From the above it will be seen that the low Nile and the failure of the rains in Abssinia and the Blue Nile is due to persistent high pressure, that is to say, to a diversion rather than to a weakness in the rain-bringing winds thus giving less cause for anxiety on this score during the coming summer season in South Africa.

THE WEATHER.

FORECAST FOR 1905.

BETTER TIME IN STORE.

ENDING OF THE DROUGHT.

(BY D. E. HUTCHINS, F.R.Met.Sec.)

My weather forecast for last year, published in the *Cape Times* of November 23, 1903, indicated the expectation of a more or less complete break-up of the drought. This forecast has been fulfilled. In many parts of South Africa, particularly towards the north, the drought has broken and good seasons were experienced last year. In other parts the rains were insufficient to really break the drought. This was the case in the fertile "conquered territory" of Orangia, and over wide areas in Cape Colony. In the Transkei, drought remains unbroken. It is described as a drought of terrible severity, and one that has stopped all ploughing and killed from 50 to 60 per cent. of the sheep in some of the districts. As was remarked by a correspondent in the *Cape Times* a few days since, no one not living here has any idea of the terrible condition existing in the Karroo and Eastern Province. "The springs on most of the farms have utterly disappeared. On one farm in the Cradock district, with large lands, orchards and a water-mill, at the junction of two kloofs in the Sneeuwberg, the river beds are as dry as the street; the farmer has sold all his stock, and I actually saw the water for household use brought some distance in a barrel. In former years, the water-mill was in constant use for all the surrounding country."

In my forecast for last year, it stated further that the general and complete break-up of the drought would take place in 1905. In fact, 1905 has been the cycle year of good rainfall to which reference has been made in all my forecasts issued during the recent years of drought. The following is an extract from the summer rainfall forecast for the period 1888 to 1920, which was published in my small work entitled "Cycles of Drought and Good Seasons in South Africa:"

1898.—Good or moderate rains, with drought at some stations.

1899.—Drought.*

1900.—(Min. sun spot cyles, 11·11 years,) Drought.*

1901.—Drought.*

1902.—Drought.*

1903.—Drought.*

* With an irregular mitigation of one or two years, good or average rainfall occurring most probably about 1901. The mitigation is uncertain, and drought may be very severe at some stations.

1904.—Drought or moderate rains

1905.—(Max. sun-spot cycle, 11·11 years; max cycle, 12·5 years.) Most probably general good rain. There is no precedent in the meteorological records for these two cycles coinciding.

1906.—Probably good rains with drought at a few stations.

1907.—(Storm cycle.) General heavy rains and storms.

1908.—Rainfall good or moderate.

It will be noted that next year, 1905, two rainfall cycles have their culminating period, that is to say, the calculated sun-spot cycle of 11·11 years, and the Cape rainfall cycle of 12·5 years. It will be interesting to note what will be the exact effect of these two cycles coinciding. It is the first time that this coincidence has occurred within the period of our meteorological records. We may say however, with confidence, that as regards the cycle indications these are entirely favourable.

The cyclical diagram for Maritzburg given at page 104 of "Cycles of Drought and Good Seasons in South Africa, will show what an important part this 12·5 cycle has played in the rainfall of Natal. Thus looking back at the cycle years, in 1855 there was a rainfall of 43 inches, in 1868 of 44 inches in 1880 of 46 inches, and in 1892 of 44 inches, while the following year had the heaviest rainfall that has ever been recorded at Maritzburg, viz., 62 inches. The mean rainfall at Maritzburg is 36 inches. Similar features are seen in the cyclical diagram for Durban, Natal, given at page 102. At the last culminating period of this cycle (1892-5) there was tremendous rain at Durban. The rain registered for the year 1893 was the highest on record, viz., 71·30 inches, the mean for Durban being 41 inches. If to 1892-5 we add 12·5 we arrive at the year 1905.

It should be mentioned that sun-spot observers expect a well-developed maximum of sun-spots in 1905, this being 35 years (Brackner's cycle) after the great maximum of observed spots in 1870.

PRESENT WEATHER IN SOUTH-EAST TRADE AREA.

Let us consider now what are the actual weather conditions prevailing in the south-east trade area around us. As last year, information has been telegraphed for to various stations on the African Continent from the Nile southwards. Information has also been obtained by cable from Mauritius, the Seychelles and St. Helena.

WEATHER ON THE AFRICAN CONTINENT.

The Nile floods have this year been below the average, owing to the failure of rains in Abyssinia or Central Africa north of the Equator. It is the Abyssinian rains which contribute most of the water to the Nile flood. In the Public Works weather report, dated Cairo, 22nd August last, occurs the following note: "A cessation or slackening of the Abyssinian rains has caused a rapid fall in the Blue Nile between the 1st and 15th of August." A cablegram received in Cape Town on the 10th instant reads as follows: "Meteorological conditions unfavourable throughout the past summer except in July. The Nile floods have been poor in June, fair in July, very bad in August, and bad in September. The Nile is still one meter below the average of twelve years at Wadi Halfa." This is important: I shall refer to it again.

On the 19th ultimo the following cablegram was received from Zanzibar: "September rainfall was below the average, October rainfall considerably above the average, but monsoon rains not yet commenced. The total rainfall this year is 16 inches above the average. Wind normal."

From Zomba, in British Central Africa, Mr. Clounie, head of the Scientific Department, speaking of last summer's rains, writes: "The wet season from November to April last has been remarkably good, and crops everywhere have been excellent. I think everything points to the end of the drought and a return to a period of good rains." Telegraphing under date the 11th instant he adds: "Wind slightly less than last year; rain good; thunderstorms frequent. October, rain 2·38: November, rain 3·49. Weather during last six months has been normal."

From Salisbury, Rhodesia, under date the 15th inst., the Government Statist wires: "Rain to date, 3·12 inches. This may be compared with 3·87, the average of the last five years for the same period. Weather generally is normal." There have been good rains in the neighbourhood of Bulawayo and the Transvaal. The rains are considered to have set in on the Eastern side of the Transvaal. During the second half of October, 4 inches of rain were registered at Haenertsburg.

The general good rains which passed across Cape Colony some days ago must also be looked upon as a favourable indication.

WEATHER ON THE OCEAN.

On the 11th of last month, the following telegram was received from Mauritius: "Temperature and wind velocity much below normal from February to mid October. Rainfall above normal in July, below normal since July." At Seychelles similar weather prevailed, so that these conditions were general over the Indian Ocean, east of South Africa. At Seychelles, temperature was below the normal since January, and rainfall much below the normal from March to July, but above in August. The wind there has been generally normal. From Northern Australia no reply has been received.

As regards the Atlantic side, there is a telegram, dated 19th ult., from St. Helena, reporting that wind there has been normal, and rainfall slightly in excess of the same period last year. In October, conditions were normal.

On the whole, therefore, these weather wires do not disclose much reason for anxiety. It is true that rainfall has been deficient in the Indian Ocean east of this sub-continent during the past few months; but, on the other hand, wind has been normal at Seychelles, although below the normal at Mauritius. On land South of the Equator, the conditions are everywhere favourable. The Nile weather might be a cause for anxiety if we knew more about the connection between seasons in Central Africa, Abyssinia and South Africa. It is a fact that the rains travel southward to South Africa, as the southern summer approaches, with the apparent motion of the sun, but the effect of the passage across the equatorial regions is a factor to be reckoned with. In my weather forecast for last year, I gave a summary of an investigation conducted by the Indian Meterological Department on the meteorological history of the seven monsoon seasons, 1893-1899. Mr. Dallas's conclusion was that excessive rain in the South-east Trade region is coincident with deficient rain in India, Arabia, and the Nile Valley, and vice versa. He states "the effects of the barometric oscillations on the rainfall were reversed in the two hemispheres, the rising portions of the oscillation conditions having been accompanied with excessive rain in the southern and with deficient rain in the northern hemisphere: and the falling portion of the oscillations with deficient rain in the southern and with excessive rain in the northern hemisphere." It is not only in the Nile Valley that there has been a failure of the monsoon rains north of the Equator. India during the past few months has been so near a famine that leave was stopped, and preparations were being made to put the famine code into force on the Bombay side. I have had a cable advice that up to the 19th inst., the mean monsoon defect was 3·27 inches. This may be compared with 3·59 the mean defect in the famine year, 1896.

In this connection it is impossible to pass without comment the remarkable paper read by my friend, Sir John Eliot (the recently-retired head of the Indian Meteorological Department), at the last meeting of the British Association in England. In this paper he discusses the Indian Meteorological data for the period 1891-1902, and proves, at any rate for this period, what has long been an article of faith with many meteorologists, viz., the solidarity of the rain-bringing phenomena in all the countries bordering the Indian Ocean. The rain falling in Burmah, India, Persia, Afghanistan, and Abyssinia, and all the eastern side of the African Continent, has its origin in the Indian Ocean, and the trade winds blowing over it. The following figures, extracted from Sir John Eliot's paper, show how closely the Indian rainfall, as a whole, has corresponded with the South African rainfall:—

Monsoon Rains.

	June to December.	Whole year.
1891	− 4·25	− 3·54
1892	+ 5·69	+ 5·09
1893	+ 4·72	+ 9·07
1894	+ 6·75	+ 6·47
1895	− 1·95	− 2·19
1896, Famine year	− 3·59	− 4·83
1897	− 0·02	− 0·15
1898	+ 0·93	+ 0·43
1899, Famine year	−11·34	−11·14
1900	− 0·26	− 0·57
1901	− 5·12	− 4·13
1902	− 1·64	− 2·05
Normal roughly	35 inches	41 inches

The paper shows that 1892, 1893, and 1894 were years of good rainfall in India. These were the last years of general good rainfall we had in South Africa. In 1895 the drought set in at most South African stations. Further, in this droughty period there were two years of bad famine, viz., 1896 and 1899. These two years of famine in India were the two worst years of drought at many typical South African stations. At present we are not in a position to obtain average figures for the whole of South Africa, but nearly the same purpose will be served by taking certain typical stations thus:—

At Bulawayo (Hope Fountain), in 1891, there was the heaviest rain on record; 1892 was an average year, for 1893 the observations are incomplete In 1898 there was drought, and in 1899, the year of the Indian famine, bad drought. If the Bulawayo observations are correct, they do not show quite so close a concurrence with the Indian figures as some other South African stations.

At Johannesburg, there were good rains in 1894, when there were good rains in India; fair rains in 1895, and then drought, when there was drought in India. 1895 (one of the Indian famine years) was the worst year of drought in Johannesburg.

Natal rainfalls correspond closely with Indian rainfalls. While 1899 was the worst famine for many years in India, 1899 and 1900 were the two worst years of drought ever experienced at Durban, Natal, since meteorological observations were begun there in 1866; in 1900, the Durban rainfall was only 27 inches, against an average of 41 inches. At Maritzburg, representing, the inland Natal districts, 1899 was also a year of drought, but the greatest deficiency was registered the following year (probably chiefly due to the calendar year dividing the seasonal year.)

Again, at Grahamstown in 1899 there was only 20 inches against an average of 2 inches; at King William's Town in 1899, only 16 inches against an average of 25 inches; while at Graaff-Reinet in 1899 there was only 9 inches against an average of 15 inches. At all these South African stations, 1899, the great Indian famine year, was the worst year of drought in recent times.

Regarding this solidarity of seasons in the countries around the Indian Ocean, Sir John Eliot observes: "During the Indian rainy period, 1892-1894, the maximum height of the Nile floods was above the average. They were abnormally high in 1892 and 1894." The rains were favourable over both Australia and South Africa during this period.

Commenting on the droughty period, 1894 to 1902, Sir John Eliot states: "The cold weather or winter precipitation was almost continuously in marked defect in Asiatic Turkey, Persia, Afghanistan, Baluchistan, the Himalayan area and South Tibet. (The opposite variation obtained in Central Asia, as is shown by available data for Tashkend, Samarcand, Irkutsk and other stations.) In India the south-west monsoon rainfall was most largely in defect in the interior districts served by the Bombay monsoon current. There was a marked tendency in each of these dry years for late commencement and early withdrawal of the monsoon currents, and for deficient rainfall throughout the whole season over the greater part of India. These features were very pronounced in the years 1896, 1899, and 1901. The region to the south of the Equator, including South and East Africa, Mauritius, and Australia was similarly affected.

"In India, the years 1896 and 1899 were years of severe drought, followed by famine over very large areas. The area in which the crops failed more or less completely was about 250,000 square miles in extent, in 1896, and 500,000 square miles in 1899. In the 1899-1900 famine upwards of 6,500,000 people were on famine relief for several months. The loss of cattle due to failure of water and fodder was very great, numbering many millions. In some districts, from 90 to 95 per cent. of the cattle died off from slow starvation and want of water. In New South Wales and Queensland almost continuous drought prevailed from 1896 to 1902. It is estimated that more than fifty millions of sheep, value £12,500,000, were lost in New South Wales during these seven years of drought.

"The Nile floods followed very closely the variation of the rainfall in Western India. The floods of the years 1899 and 1901 were both amongst the lowest on record. This shows that the rainfall in the Abyssinian region was more or less generally in defect during the period, and most largely in the years 1899 and 1901, when the rainfall of the Bombay monsoon current was very deficient.

"Hence, as a general inference, the period 1895-1902 was characterised by more or less persistent deficiency of rainfall over practically the whole Indo-oceanic area (including Abyssinia). The economical results in the dry interior districts of India, South Africa, and Australia were the same—large loss of cattle and great loss of capital. The drought in Southern Asia was as marked in the north-east as in the south-west monsoon, and hence the variation was not seasonal but general." (Brit. Ass. Opening Address by Sir John Eliot, chairman of sub-section Cosmical Physics, Cambridge 1904.)

The Indian figures bring out this further interesting point. During the rainy period 1892 to 1894, air temperatures were below the normal, in consequence of the increased cloud and rain; but the solar radiation (as deduced from the blackened bulb in vacuo) was in excess, while in the following dry period from 1894 to 1902, the air temperatures were in excess, while solar radiation (deduced from the blackened bulb in vaccuo observations) was in defect. This interesting relation may have a bearing on the apparent gradual diminution of rainfall throughout the world, this being co-related with a slight decline in solar energy.

Sir Norman Lockyer and Dr. Lockyer in their paper read before the Royal Society in 1900 on "Solar Changes of Temperature and Variations in Rainfall in the region surrounding the Indian Ocean," established this relation between sun spots, and rainfall. Maximum and minimum sun spots in India but particularly maximum sun spots, accompany good rains. Minimum sun spots in Mauritius bring particularly good rains. It is in a period between maximum and minimum sun spots that all the bad famines in India have occurred. We are now approaching a period of maximum sun spots, and consequently a good rainfall for India and South Africa, but the unfortunate part about the maximum and minimum period of observed sun spots is that generally it cannot be known for certain when they occur until the period is passed.

On the whole, I am inclined to think that the bad news from the region north of the Equator need not cause permanent disquiet here. In Australia the drought is thoroughly broken, and good seasons continuing. Mr. H. C. Russell, for so many years the Government Meteorologist in New South Wales, has made a particular study of the cyclical variations of rain in that country. I have shown elsewhere that his cycles coincide generally with those which were indicated some years previously for South Africa in my "Cycles of Drought and Good Seasons." Mr. Russell predicted good seasons for 1904 and 1905—a prediction which we know has been completely verified for 1904. It may be interesting to note that Mr. Russell attributes his cycles to lunar influence. He considers that when the moon's course is to the southward in the Southern Hemisphere, more rain falls than when the moon moves to the northward.

FORECAST FOR SOUTH-EAST SUMMER RAINS: SOUTH AFRICA GENERALLY.

From the above it will be gathered that the cycle indications are strongly in favour of the approaching summer rains being good throughout South Africa, and that a consideration of the weather prevailing in those parts of the globe influencing the coming South African weather are not such as to cause permanent disquietude. I consider that we have now before us throughout South Africa a period of good rains, the only possible exception being the dry far inland regions, where the rainfall is too erratic to admit of forecasting, that is to say, the inner Karroo, the Kalahari, and Namaqualand. We may, during the coming summer, look for strong south-easters in the Cape Peninsula and South-west.

If in the coming good seasons there is a temporary set-back, let us remember the low Nile and the partial failure of the rains in India. There may be a general temporary set-back, and, of course, local partial failures must occur; but that South Africa is about now to enter on a period of general good seasons, may, I think, be confidently anticipated.

WINTER RAINS—CAPE AND SOUTH-WEST ONLY.

It is convenient here to add a forecast for the rains of next winter in the Cape Peninsula and South-west of Cape Colony. It may be said that these rains are of comparatively small moment, compared to the widely-extended summer rains. But the western winter rains have their importance, as watering some of the best agricultural and forest districts in Cape Colony; and when we think of the Cape Peninsula struggling with its nearly always excessive winter rainfall, there are the comfort and the gardens of one-fifth of the white population of Cape Colony to be considered! Unfortunately, we have here little but the cyclical indications to fall back upon, and these failed during the winters of 1902 and 1903. For 1904, the cyclical forecast was: "Rainfall intermediate or average" (page 83, "Cycles of Drought and Good Seasons in South Africa.") The actual rainfall was 20 per cent. in excess at the Royal Observatory, and 23 per cent in excess, taking the mean of 13 other stations in the Cape Peninsula. In the whole of the south-west area, however, the excess was small. It was only 3 per cent. at Ceres, the typical inland station for winter rainfalls. If we take the mean of such representative stations as Knysna, Swellendam, Caledon, Ceres, Robertson, Drakenstein, Malmesbury and Clanwilliam, the average excess, amounts to only 5·6 per cent. There was a deficiency of 10 per cent. at Clanwilliam and 20 per cent. at Swellendam. Taking the whole South-west area, therefore, last year's forecast came out correct.

FORECAST FOR WINTER RAINS, 1905—CAPE TOWN AND SOUTH-WEST OF CAPE COLONY.

As we have seen, two cycles have their culminating period in 1905, a conjunction which has not occurred before during the period of rainfall records. Either taken alone might indicate a winter of unusual wetness, though the influence of the 12.5 cycle on Western winter rainfalls is uncertain. In 1892, the last culminating period of the 12.5 cycle, we had a winter of terrific rain in the Cape Peninsula; 41 inches at the Royal Observatory, against an average of 25 inches; but previously, in the Western winter rainfalls, governed by the Atlantic storms, the influence of the 12.5 cycle is scarcely discernible. Thus, in 1842 it brought rainfall barely above the average; in 1855, slight drought; in 1867, a rather drier winter; in 1880, the driest winter but one ever recorded. Thus the cyclical indications for next winter's rains are uncertain.

Considering that we have had two abnormally wet winters lately, and that in 1907 another wet winter is almost inevitably due, we may perhaps hope that the winter of 1905 will not produce excessive rain.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal,* Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

The Cape Muscat.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the correspondence of the October number of the *Journal*, I notice an enquiry as to the origin of the Red Hanepoot.

The White Hanepoot was introduced into the Colony in the early part of 1800, and two rows of that grape were planted as an experiment at Groot Constantia between 1820-1830. Cuttings from those vines, were distributed throughout the vine growing districts. Amongst others, some were given to a Mr. Eksteen, who had a vineyard where the Rosebank Show is now held. When these young vines started bearing, *red grapes* were found on *one branch* of a vine.

When the owner of Constantia heard of this, he requested Mr. Eksteen to mark the vine and save all the cuttings off that branch; this was done, the cuttings were planted at Constantia and from them the Red Hanepoot originated.

The Red Hanepoot has been known in England for many years as the "Red Constantia," and I believe will still be found in many hot houses there.

I believe botanists would call the "Red" a *sport* from the "White" Hanepoot.—Yours &c.,

C.

5th October, 1904.

Another Scourge for Stock Farmers—The Jointed Prickly Cactus.

SIR,—Amongst the subjects to be considered by the Farmers' Congress which sits in Somerset East during February next, is the very serious question of the prickly cactus (*Opuntia pusilla*, Ham). This cactus is certainly an enemy in the presence of which "Prickly pear" "Burweed," "Mexican Poppy" or any other proclaimed noxious weed, pales into insignificance Though comparatively small to look at, it is a giant in the way of spreading and ruining good country. I was amazed a short while ago to hear that it has pretty well established itself in all or most districts from Humansdorp to King William's Town! My farm I am glad to say, and all the upper portion of the Bedford district is free but the lower portion is full of it and it is now spreading like "wild fire" all along the river banks right down to the sea.

What serious results to our Colony must follow if this cactus is allowed to spread cannot be comprehended by those who have not seen it. It has a spiked thorn with barbs on and grows in sectional joints of a quarter of an inch long, and on the slightest contact with anything passing, these barbed thorns catch on and it snaps off at the joint and will cling to the tail of a beast or horse or to the fleece of a sheep or goat and be carried for many miles along roads or over neighbouring farms, and wherever any piece drops it is *sure* to grow.

Legislation of the strictest nature is required for the compulsory eradication of this scourge and not a day should be lost. Where necessary, assistance from Government should be given, but it's *got* to come out, or the country where it spreads must be abandoned to it. The area infected with this plague is comparatively speaking small yet, and with firm measures it could be stamped out. Will the country and the Government not wake up to its duty in this matter? If necessary stop building railways, but rid the country of this scourge which is going to very soon cost it millions and millions. In the matter of scab our principal loss is the wool, but look at what this cactus is doing for us, it is robbing us of our most valuable and only solid asset, our good grazing land! And how much longer is this to continue? As I have said before it's *got* to come out, and what would cost hundreds now will cost millions in a few years to come. Our member, Mr. Molteno, I am told, has often promised to move in this matter but there it seems to end. May I ask those gentlemen among your readers who know of the existence of this cactus in their districts to write a few lines for publication in your *Journal* stating the facts so as to enable us to ascertain to what extent the scourge has actually spread in this Colony?—Yours &c.

OSCAR E. G. EVANS.

Bedford, December 9th, 1904.

A few more words on Sluiting.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read the lecture by Mr. Sim, District Forest Officer, King William's Town which appeared in the *Agricultural Journal* as also other letters in the *Cape Times* &c., referring to the above subject, and with your permission I would like to add a few lines so as to present it to your readers in a way which I hope will enable them to look at it in an intelligent and know-something-about-it manner from our point of view.

There have been any amount of theoretical suggestions, but as far as I can make out nothing practical has been put forward yet. Any one travelling through the Colony can see the destruction caused by sluits carrying off the rain water and the soil, and the farmers are not so apathetic as the theorists appear to assume.

The Colony is large and very differently circumstanced—some parts differing vastly from others. We may take it roughly that about three-fourths is subject to periodical droughts more or less severe, and is also subject to terrific thunderstorms. I have known four inches of rain fall in two hours! five-and-a-half inches in one afternoon. Can one who has not seen it realise such a fall? Picture the water rushing from the mountains and hills in torrents filling every valley from one to more feet in depth rushing into the rivers, overflowing their banks, rooting out trees, carrying away occasionally hundreds of sheep and goats in its mad career. Can you see it? Look at the driftwood on the banks of the Salt, Sak, or any other river several feet above the river banks, and you will know that I am stating facts.

All this part of the country is by no means flat, but is on the contrary hilly and in some districts very mountainous. Now, that being the case, the beginnings of the "Sluits" are to be looked for, not along the sheep footpaths and roads, but in the kloofs and gullies rising in the mountains and hills, so that by the time the rain water reaches the roads and footpaths, it is already in considerable volume, consequently the attack should be made at the source of the evil, which would be in the mountains and hills (Mr. J. Sim, *Agricultural Journal*, page 287.)

Now just here comes the beginning of difficulty. The hills and mountains are rough for travelling, many of them steep and high, and consequently ungetatable without roads. Water for the men would have to be carried, as though there are fountains here and there, the work would as often be miles as yards from the springs, so roads would have to be made, expensive mostly if at all even practicable.

Then again in the hills and mountains there is much stone but little earth consequently the work would be costly.

As the fall in these mountains and hills which are as frequently as not conical would be in every possible direction with a tendency towards the general average slop of the country, the only way to catch up the water would be obstruction at right angles to the fall and as this is usually steep, terraces would have to be made, and here the stone comes in. According to the general slope the terraces would be more or less broad and in the case of conical hills would be circles round the hill of wider and wider diameter

I am putting this as an extreme view, but it is no use blocking up the "kloofs" for that would dam up very small portions of the area, probably to be destroyed by the first heavy thunder shower that happened to come along; or if not destroyed would silt up with sand incapable of supporting vegetation.

As we come lower down into the flats, these terraces would become more irregular in shape and wider in area till we are down, and stone having become exhausted for the retainers, we should have to resort to ground banks, these in all cases being carried along in sufficient strength and across the fall in whatever direction it may happen to be. No damming up of sluits will answer, as the water would only rush round the end of your dams and make a fresh sluit.

We will suppose now that the fall has dwindled down to an average of one in a hundred. We will suppose also that the fall is equal and absolute at one in a hundred, like a table tilted. Well, then, it would not be sufficient to have one bank across each hundred yards, as retaining water to cover, the whole would stand three feet at the lower reach, killing the vegetation to nil at the upper, consequently a larger number would be required—say, four for each 100 yards, so then we would have the water nine inches at the lower reaches. Those dams, however, would have to be pretty strong, for if one break through mice holes, ant bears, &c., others would go, and as the volume of water accumulated, there would be a general wash away all down the slope. To save this to some extent there would have to be breaks or banks made from the cross banks at right angles, like the teeth of a rake The bar of the rake would represent the cross bank and the teeth the breaks, so that all the water from each cross dam could not run out in case of accident. Now, the least strength for these cross banks would be, say, one yard high, or, say, one cubic yard of earth per running yard of bank, and for every running yard of embankment a hole will be dug and the ground shifted, and as the holes will probably be shallow, the area disturbed and the herbage destroyed would be two or three square yards for every cubic yard of bank, or ten or fifteen hundred yards for every morgen of ground. This is a serious matter, but might right itself in time.

As to expense, we will take the ground work first. On every morgen of ground—supposing the farm to be flat with a general slope of 1 per cent.—there would be four banks 100 yards long, and say one at right angles averaging 100 yards. That is 500 yards of ground work, at 4d. per yard works out about £8 odd per morgen! Suppose we spent only £2 per morgen in this work, less would be useless as a preventive of sluiting.

Now, sir, we are at the pith of the matter. The work requires capital. Capital most of the farmers have not, and I believe a large number of the farms are mortgaged already. Who will advance £2 per morgen on this area? Who will advance £1? We have a liberal Government willing to advance at pound per pound at so much per cent. payable by-and-bye, but where are we to get the other pound?

Now as to tree planting. Please, dear theorists, I would like you to take notice that in this vast area not a tree will live unless it gets water at least once a week till it is established, and then say once a month for years. All the water available for trees is up to miles away from the limits of the farms. Once a week every tree would require at least two gallons of water. One 400-gallon tank would be enough as a load for, say, 10 donkeys or eight mules, and would water 200 young trees, which, at five yards apart, would be one-half morgen of ground, or two loads of water per morgen. Say the average distance from the water would be two miles, it would take, say, three hours for each load filling and distributing or say four loads per day. Cost of labour, wagon and donkeys say 20s. per day. *i.e.*, 10s. per morgen, and with planting 20s. per morgen, and *only one* wetting. Here we have 20s. per morgen again, add 10s. per morgen for watering per week, or two pounds per month, and the thing is quite simple. Again we apply to our Government at £ per £.

Theorists may laugh at me, but allow me to tell them that at Beaufort West, Bakens Rug, and other places the plantations have died from want of water, although they were formerly kept alive at leading or irrigating distance. Such is life. What is to become of trees miles away dependent upon the water cart. In one whole year a span of donkeys could not water a tenth of one small farm, or say 500 morgen of trees, *only once*.

Again stock having to be kept from these plantations until the trees are big enough would render the farm practically useless for several years. Fences might of course be made but are we justified in going to Government for any more £ per £ advances. I fear not.

The safest way for us would be to agitate for fencing as a preliminary and perhaps in the future our children may undertake the larger work.

I have put my remarks in this form to show the extreme case but even if partially carried out as suggested by Mr. Sim and others there is no question but that the expense if not the difficulty of reaching the parts of the farms where it is advisable to stop sluits, and half of them originate in one's neighbour's farms, will be a very great handicap, and as to planting trees in three-fourths of the Colony the thing is impracticable as no trees would grow, And take any kloof, precipitate as most of them are, a dam at intervals of 100 yards would mean a sovereign or two (probably more than ten) for each dam so where would a thousand sovereigns go in damming one kloof such as there are millions of in this country.

It may have struck some that the diminution of the rainfall may to some extent be attributable to the number of wells and fountains opened up.

By means of these wells the underground water is carried to the surface and distributed and so evaporated, consequently the depth below the surface is materially increased till the roots of the hardiest herbage can barely reach it and the less hardy perish when there is a spell of drought. The ground is consequently more and more denuded of herbage than by erosion the soil is carried away, until by degrees the country becomes parched and almost incapable of supporting the little herbage there is left, and so from flourishing farms with valleys filled with rushes, brush, &c., we have the arid plains every day becoming more and more incapable ot supporting vegetation. Besides this the lower stratum of air becomes so dry that even when rain clouds do come and pour out their treasures the dry substratum catches it before it reaches the earth. This may be observed by careful observers all too frequently in these districts.

As to bush and grass burning. On the area I am treating of, there is no such thing except by accident in the mountains. In the coast lands which would be the remaining one-fourth of the Colony, grass burning may take place to a more or less extent and is certainly to be deprecated, but I am not sufficiently acquainted with those parts to offer a criticism.

Trusting that these few lines may be of some use to clear up and extend the view on sluiting, its consequences and cure.—Yours &c.

A.S.J.

Beaufort West, December 10th, 1904.

Scab in Sheep and its Eradication.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—A great deal has been said and written within the last few months on the above subject, and there is no reason why I should not have my say. I have been a sheep farmer for over forty years, and it was not until I took to using lime and sulphur in proper quantities, properly mixed and properly used, that I effectually succeeded in eradicating scab in my flocks. Previously I had used almost every imported dip manufactured; some appeared to cure for a time, but scab made its appearance sooner or later. The impression was that the sheep were being reinfected, until a thorough examination of every sheep was made a few days after the second dipping, when living scab was found to exist on some sheep in every flock, generally found on the dew-lap and behind the hind legs. This discovery was convincing that there was no reinfection from outside, but that the sheep were never cured, and that it would be futile to continue using these imported dips. It was then decided to try lime and sulphur.

After two dippings all the flocks were perfectly cured, and during the last six years I have never seen a scabby sheep on my farm.

Two of my sons, farmers in the Steynsburg district, had exactly the same experience as myself with imported dips. After taking my advice and using nothing but lime and sulphur, they have not only cured their sheep, but have had clean bills ever since.

As to the supposed damaging effects of lime and sulphur on wool, I made a number of experiments, dipping sheep with various lengths of wool. After shearing, samples of wool were handed to the late Mr. H. B. Christian to be handed to wool experts for their report. Their reports, together with the samples of wool, were handed to the Chief Scab Inspector, Mr. Davison, and by him published in the *Agricultural Journal* for 1899, No. 13, Vol. XV., page 843, headed "Experiments with lime and sulphur dip."

The present is an opportune time to look this matter up and re-publish it in your valuable and interesting Journal.

As to the present Scab Act, it is proved to be not only expensive but unsatisfactory, and requires to be amended to make it workable.

The worst feature of this Act appears to be in the appointing of Scab Inspectors by the farmers instead of the Government. Competent inspectors should be appointed by Government, and summarily dismissed if found incompetent or wanting in their duties. At the same time no inspector or number of inspectors would eradicate scab from the Colony without the hearty co-operation of the farmers. The farmers must co-operate.

As to the expenditure of £80,000 a year so much harped upon, who is to blame? the farmer. If every farmer did his duty and was determined to clean his sheep, there would be no need for legislation or Scab Inspectors, every farmer would and should be his own inspector.

If any farmer says he cannot cure scab with lime and sulphur, he talks nonsense or he does not know what he is talking about. If my opinion were asked I should say prohibit the use of all imported dips, and although I do not advocate running to Government for assistance, I would give the farmers lime and sulphur free, delivered at their nearest town, siding or station for a period of three years, without being tied up with too much red tape, and so encourage in every way the use of lime and sulphur.

It would then only remain to secure the co-operation of all colonies north of the Orange River as well as Rhodesia and German West Africa and keeping a strict eye on all importations, and within five years South Africa should be rid of scab.—Yours, &c.,

W. R. SOUTHEY.

Schoombie, December 6, 1904.

Sluits and the Damage they Cause.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the memory of some people still living—this part of South Africa was practically uninhabited by white people; and wandering Bushmen used to hunt the game; at that time the vegetation was rank and luxuriant and the ground spongy and porous, running fountains were numerous, and vleys with pools of water and dense masses of reeds were met with in many places.

In course of time the country became divided into farms and occupied by white farmers, and later on the district of Herschel got gradually filled up by natives from other parts of South Africa

The farmer introduced livestock, cattle, horses, sheep and goats, and these increased in course of years till in some cases the utmost capacity of the farms for the successful rearing of stock was reached.

At the same time the natives were rapidly stocking "the native Reserve" now called Herschel; nearly every trek of natives coming into the district having their small flocks of sheep and goats, besides horses and cattle, and these have gradually increased in spite of all destruction caused by wild animals and diseases amongst stock, till in many parts the country is overstocked.

For many years it was necessary to kraal all sheep and goats every night to help to secure them against the attacks of wild animals, such as wolves, wild dogs and jackals. This necessitated a constant trampling of the veld, backwards and forwards, morning and evening; and in the native territory the same constant trampling took place, but this was intensified by the thousands of stockholders each having to keep his own flock distinct and separate from his neighbours. In this way every available square inch of ground was trampled on, to the tops of the highest mountains. The effect of this was, that in dry weather, there was a constant wearing and loosening of surface soil by the sharp-edged hoofs of the sheep and goats, and the loosened particles of soil were carried down by the heavy thunderstorms to the valleys below. In wet weather, the effect of this constant trampling of the veld, was to render the soil less spongy, and less capable of absorbing the rain which fell, and therefore the rain ran off in increasing bulk, and running along sheep and cattle tracks, wore them into tiny sluits which increased in depth and width, the farther the water ran.

In this way, during the writer's lifetime, valleys that were filled with luxuriant vegetation so dense that a span of oxen could not be seen in them from the outside—are now yawning chasms, extending for hundreds of yards in length, and scores of yards in width, and so deep that a person falling into them on a dark night would be killed!

It is quite possible that an engineer looking at these sluits might see a means of blocking them and thus making small lakes—which might be able to furnish enough water to irrigate hundreds of acres of good ground.

It is now high time that the matter was looked at seriously, and means thought out of altering the present state of things before the country becomes utterly ruined, and a vast desert takes the place of what was formerly succulent pasturage.

Up to the present time the apathy of some of the farmers is simply beyond comprehension. To remedy this state of thing farms should be divided into paddocks as far as possible, each paddock should have its own water supply. Every effort should be made to poison wild carnivora on a large scale. More *veld dams* should be made wherever a suitable position can be secured—to prevent the necessity of stock wandering for miles when they want water.

Longer terms of imprisonment should be given to sheep stealers and sc. while the thieves were being kept out of mischief they should be made to do useful work for the benefit of the country and thus instead of being a drain on the farmers they would be a source of revenue to the country.

Existing sluits should be dammed up at intervals, and shoots of willow or roots of poplar planted in them; the sides of sluits could be advantageously planted with the Robinia which spreads rapidly and makes valuable wood for yokes, fencing poles, &c., besides being to some extent self-protecting on account of its thorny nature. The American Aloe is also to be recommended where sluits are beginning to form.

As farmers bring more and more land under the plough the ground will absorb more water than when it is constantly being trampled on. Farmers may do a good deal to prevent the constant driving ot stock backwards and forwards on their farms, but in the native territory it seems hopeless to expect any substantial improvement.

At the present time and in existing circumstances the veld in native territory is rapidly deteriorating, where wild olive trees and other trees used to grow in profusion, every vestige of them has long since disappeared. Thousands of acres of fine pasturage are now almost denuded of grass, and are sparsely covered by useless weeds, or Rosin Bushes.

Where forty years ago stock cattle, fit for the butcher, could be seen grazing, it is now scarcely possible for cattle to put on sufficient flesh in the summer, to protect them from the cold of the succeeding winter.

In the Aliwal North and Lady Grey districts there are a number of excellent farmers whose successful farming is an object lesson not on y to travellers who pass through the country, but to the surrounding farmers, who are not slow to notice where proper farming is carried on, and who in many cases take valuable hints from what they see.—Yours &c.

O.B.

Herschel, Dec. 6, 1904.

Citrus Culture Commission.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—At a meeting of the Farmers' and Fruit Growers' Association of Victoria East, held on the 19th ult., the Report of the above Commission was discussed, and I was instructed by resolution to take exception to the inadequateness and misleading nature of the said Report.

In the first place, Mr. Attwell is not the only possessor of orange groves in this district; there are many others, at least nine, that have groves of from 500 trees. One owner's output last season was 160,000. None of these were visited and reported upon in the same manner as the report given under the heading of "Grahamstown."

The district is now, owing to the completion of the Railway, in a position to treat with buyers of oranges from anywhere, but what buyers of same are likely to come here after reading the above report?—Yours, &c.,

E. H. DEWEY,
Hon. Secretary
V. E. Farmers' Association.

Alice, Dec. 3, 1904.

Electricity for Pumping.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would be glad if you could give me some information on "electricity as a pumping agent," as I think it will be of great service to many farmers in this country. If I understand aright, electricity has to be generated by power. Can this energy be stored, and let out in a smaller current than it was generated?—*i.e.*, suppose I have a bore-hole on my farm, which has a supply of, say, 3,000 gallons per hour; if I have a steam or oil engine to pump the water out, I can only pump for about ten hours per day —30,000 gallons of water.

But, on the other hand, if I set the engine to drive an electric-generating plant for ten hours, which could in turn spread the energy over the whole day (24 hours), pumping 3,000 gallons per hour, I should have 72,000 gallons of water at my disposal instead of only 30,000 gallons per diem. Of course I should require more than double the horse power.

If my plan is practicable, I shall also be much obliged if you could inform me where such a plant can be obtained.—Yours, &c.,

FRANK BIGGS.

Graaff-Reinet, Nov. 28, 1904.

The plan is practicable in a sense, but would, we fear, prove far from economical. The plant would be costly, as it would have to include the provision of a dynamo and a set of storage batteries, as well as an engine capable of doing the work of driving the dynamo for storage. In addition, it would be also necessary to instal an electric motor for using the stored current. We believe it would be cheaper and better to put in duplicate oil or steam engines. Our correspondent should apply to any reputable engineering firm for details of such a scheme, say Howard, Farrar & Co , of Port Elizabeth.

Remedy for Moles.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice in the current issue of your *Journal* a correspondent asking advice as to the best means of ridding his "lands" of moles. On this point, I can give him the benefit of my own experience, which I have never known to fail.

You take a raw potato, make a few holes therein, filling each one with arsenic, covering over so as to make the potato look as if it were an ordinary "undoctored" one. You then place this potato in the mole hole, being careful to disturb the mound as little as possible, smoothing the ground back into place. If this is done, especially at a season when there is little in the garden for a mole to eat, it never fails. I would be glad to hear from your correspondent if the plan succeeds.—Yours &c.

MARAIS.

De Put, November 23rd, 1904.

The Bakoor Jackal.

To the Editor AGRICULTURAL JOURNAL.

SIR,—In your November number you say the Bakoor Jackal seems only to be known in the Western and North-Western districts. I have the skin of one I got from a Kaffir while living on the border between the Mount Currie and Umzimkulu districts about four years ago. This jackal was, I believe killed in the Umzimslava valley which may be of interest. At the time I knew little about jackals or would have made further enquiries. I have never seen another skin nor do people hereabout recognize it so that it must be exceedingly rare.—Yours &c.

LAWRENCE C. FRENCH.

Maclear, November 20th, 1904.

Fowls and External Parasites.

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To the Editor, AGRICULTURAL JOURNAL.

SIR,—May I ask you for information, or for guidance to some source of information, as to the varying susceptibility of different breeds of fowls to insect pests?

I have a mixed lot of Black Minorcas, White Leghorns and Buff Orpingtons. About 70 chickens were confined in one house, and I found them badly infested with the "head louse," but in very varying degrees. The Minorcas were very bad, while the Leghorns were quite free. The Buff fowls were not as bad as the Minorcas.

I removed all the chickens to a clean house, and treated them but (for experiment) left the house uncleaned, placing in it a lot of about thirty chickens, fresh from the incubator, Minorca and Leghorn only. In a few days I found the same result, the Minorcas were badly infested, the Leghorns were clean. I then had chickens and house properly cleaned and the pest cleared out,

Was the immunity of the Leghorns probably due to colour, the insect preferring a darker habitat; and are white fowls recognised as being less susceptible to such pests than dark fowls?—Yours &c.

GEORGE S. STEWART.

[illegible] Dohne, November 18th, 1904.

We have no information on the question raised. The recognised cause of immunity is generally ascribed to the better physical condition of one bird as compared with the other. Perhaps some of our poultry correspondents may have some information on this point.

Ostriches, Moles and Bees.

To the Editor AGRICULTURAL JOURNAL.

SIR,—The bar in ostrich feathers is caused by the bruise of a stick or stone or other hard substance while the feather is in the blood pen stage. If a feather is pulled before it is ripe that place is ruined for ever for producing good straight feathers again. Wild birds are far from anyone to give them a knock, thus good feathers.

To catch moles, get a mousetrap and dig the soil from a run and set the trap in and cover with a piece of wood or corrugated iron and make it dark, and you will soon get the mole. I've killed scores with this.

I've often got swarms of bees and put in box, but they all leave after three or four days. Could any of your readers tell me how to be able to keep them and tame them, and what is "queen proof wire?"—Yours, &c.,

J. G. LIDDELL.

Harrismith, O.R.C., November 14.

Poultry for Profit.

To the Editor AGRICULTURAL JOURNAL.

SIR,—I have read with much interest "Enthusiast's" letter in the last issue of your Journal, as I am one of the "half-dozen men in South Africa who aim at utility," but the encouragement received is very scanty. I imported a pen of white Wyandottes last year from the Worcestershire Poultry Farm, one of the most noted utility establishments in England, and since their arrival I have not been a single month without eggs. I have a number of cockerels and pullets bred from them, and several people who have stated they wanted birds of a good laying strain, not for exhibition, have seen them, but in every case have pointed out that the comb is not quite to standard, or the colour of the legs is not sufficiently deep, or some other point is not in accordance with fancier's ideas, with the result that they have offered me 1/- or 2/- more than the price for which the common fowl can be purchased. It stands to reason that a man cannot afford to import birds, and after breeding from them sell their progeny at or about the same price as the barndoor fowl.

With regard to eggs, I have sold several sittings this season, and have only had to replace two eggs that were unfertile. The last three sittings I disposed of hatched out eleven, twelve and thirteen strong chicks respectively, *i.e.*, thirty-six from thirty-nine eggs, and this at the end of the season, October and November.

I am not a believer in cross-bred fowls, as I consider pure-bred birds, if carefully selected and properly mated are more profitable, as in the cross-breeds it frequently happens that in the progeny, the faults of the parents are perpetuated to a larger extent than the good points.—Yours, &c.,

W. J. GIBBONS.

P.O. Box 1369, Cape Town.

Cooper's Dip for Tapeworm in Lambs.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In answer to Mr. Fred. J. Pentz's remarks in the November *Journal* about Cooper's Dip for Tapeworms in Lambs. The following is a safe and effectual way, take

2½ months old, 1 oz. of Cooper's dip, to 1 gallon of water,
3½ „ 1 oz. „ „ „ 1 „ „ „
When weaning 1½ oz. „ „ „ 1 „ „ „
(A gallon of water weighs 10 lbs.)

Dose for lambs, one tablespoonful of liquid. While dosing keep the liquid agitated, take a pint bekker and renew as you go along.

Make a funnel from the horns of a young beast, by cutting off the point, then boring a hole into the pith space. Put the thin end well back into the lamb's mouth. Turn the hand well round, from below, so as to close chin and upper lips, with thumb and forefinger well on to the horn, then dose, there will be neither wasting nor choking.

I have used this dose for 23 years with every success. No need to separate lambs from mothers.

Dose from the mothers and when finished put the mothers to the lambs: and drive the lot off to the veld.

Cooper's dip in "pinches," is very dangerous, there being more powder in a "pinch" on a cool, than, on a dry morning; *don't mix the medicine over night.*

When dosing for "Geilziekte (braxy) in sheep, take 1 part of Coopers dip to 10 parts of salt; but, instead of salt, take water as it is easier to administer through a funnel—dose a teaspoonful.—Yours &c.

W. H. BERRINGTON.

Jansenville, November 26th, 1904.

P.S.—I have used 1½ oz. Cooper's dip for lambs and kids 3½ months old, with success.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—For Tape worm in lambs we have used Cooper's dip as follows and it is certain as a cure: For every pannikin (1 lb.) of water take one teaspoonful of Cooper's dip not too fully heaped up. Mix the Cooper's dip with just a little water into a paste and then mix with water in a bucket and give each lamb *one* tablespoonful as a dose (I tried two tablespoonfuls on ten lambs to test it but all lived, so the remedy is safe). We give this dose to every lamb when castration takes place say at six weeks or so old.

Care *must* be taken to stir the stuff thoroughly before each dose is taken out and notwithstanding every care the mixture becomes too strong towards the end and must be thrown away as it is then dangerous.

I count the tablespoonfuls in a pannikin and allow enough for the number of lambs to be dosed, and we do not mix more than say three or four gallons at a time. We have used this remedy for 20 years when necessary.—Yours &c.

A. S. J.

Beaufort West, December 10th, 1904.

Little's Dip and Locusts.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We have received the attached letter from a country client of ours, bearing on the destruction of locusts with Little's Dip, and we would feel much obliged if you would kindly reproduce same in the columns of your Journal, as we feel it will prove of special interest to your farmer readers.

Thanking you in anticipation.—Yours, &c.,

p.p. MORRIS, LITTLE & SON, LIMITED,
W. FIDDIAN GREEN.

Port Elizabeth, November 18, 1904.

Copy of letter received from Mr. H. W. Maynard, Post Office, Vogelstruisnek, District of Tarkastad.

November 1st, 1904.

DESTRUCTION OF LOCUSTS.

DEAR SIRS,—I have killed locusts with one part Little's Dip to 40 of water. It is, however, not certain to kill in all cases, unless 1lb. of caustic soda is added to every five gallons of the dip solution, one to forty. The dip and caustic soda combined are *sure* to kill.

You can make whatever use you like of this information, as it has been tried by others as well as myself, with, in every case, best results.—Yours, &c ,

(Signed) H. W. MAYNARD.

Blasting Near Springs.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Blasting with dynamite near a spring does not destroy it, and if its bottom consists of a firm, solid bank, no damage will result either. But if there exist large fissures between the boulders damage is sure to ensue, the force of the exploding dynamite acting in a downward direction, widening the fissures, into which the water descends. There is a fountain of this description on the farm mentioned below belonging to Field-Cornet C. Bester.—I am, etc.,

JNO. D. BESTER.

Scorpion Drift, Carnarvon, December 2, 1904.

Croft s Tincture—A Challenge.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Referring to that portion of "Enquirer's" letter of November 5th, 1904, relative to the failure of "Croft's Tincture of Life," I should like "Enquirer" to be so good as to inform me if the Tincture was used absolutely according to the directions issued with the bottle, also if he had taken care of the tincture whilst in his possession, *i.e.*, kept the bottle securely corked.

Again, would he also inform me from whom he purchased the tincture, and about when.

In my letter of November 8th, 1904, I guaranteed that Croft's Tincture *will cure the bite of any snake in South Africa*, and I therefore challenge "Enquirer" or anyone else to prove otherwise, providing my directions are followed out to the T.

I have numerous testimonials to hand proving the tincture to be absolutely reliable, and the Ringhals snake is mentioned in a good many.

Two testimonials lately received, one from the North, and the other from South Cape Colony, prove the tincture to be a reliable remedy for the bite of the "Puff Adder," let alone the "Ringhals," and in each case it was the life of a native saved.

My grandfather, the gentleman who first made the tincture, tested it upon himself by letting a Puff Adder bite him, so I'm absolutely certain that "Enquirer" hasn't used the tincture properly, or that the tincture has deteriorated in some way through neglect.—Yours &c.

C. T. CROFT,

Kimberley, Dec. 14.

RURAL REPORTS.

For the month ending 15th December, 1904.

Aberdeen.—We are having windy and promising weather at present. Light rains fell at the beginning of month and veld is in fair condition though locusts have done much damage. A fair crop of oats has been harvested. Fruits promise well. Cattle are not doing as well as they might. Horses and small stock remain in about same condition as last month. Angora goats are improving, kids dying of worms. Ostriches have fallen off a bit.

Bedford.—Weather very dry and every indication of drought. Prevailing winds are South and South-West. Days hot, nights chilly. Rainfall very light amounting to only 0·6 inches as against an average of 3 to 4 inches. Veld is dry and completely burnt up. Vast swarms of locusts in voetganger stage have made their appearance and are rapidly demolishing the remaining pasturage. No crops owing to drought and locusts. Cattle in low condition. Sheep and goats have been doing rather better since the rain began to fall about five weeks ago. Ostrich chicks are showing signs of tapeworm. Large birds have slightly improved of late. Prospects on the whole are discouraging.

Carnarvon.—No rain has fallen this month. Weather dry and warm with high winds prevailing. Veld in poor condition. A good crop of wheat has been harvested but nothing else. Fruit in bad condition. Cattle are in fair condition. Horses doing well and prices high. No breeding. Sheep in poor condition but goats doing fairly well.

Hay.—Rainfall light. Veld in poor condition still and more rain urgently needed. Oat crop is ripening well. Cattle are in pretty fair condition. Very little calving. Horses in fair condition. Mules scarce but doing well. Small stock in poor condition.

Jansenville.—No rain has fallen in the village during the past month but elsewhere in district rains have been variable, and heavy in some wards. Weather on the whole promising and veld in fairly good condition. Mealie crop good. Not much wheat and oats sown. Lucerne coming on well. Livestock of all descriptions are in good condition.

Kuruman.—Prevailing weather at present is windy and warm. Rainfall for month has been light and veld is still dry. Wheat and oat crops are light but good. Mealies are still being sown. Cattle are in fair condition and calving promising. Horses, mules and donkeys doing fairly well and are also sheep and goats. Ostriches in good condition. Pigs fair.

Mafeking.—Rainfall average. Weather mild. Veld in good condition. Livestock of all descriptions are in fair condition.

Malmesbury.—We are having very cold weather for the time of year. Rainfall heavy and far above average. Veld in fair condition. Wheat and oat crops good. Rust on some farms. Cattle in fair condition. Slaughter animals expensive. All other livestock doing well. Pigs plentiful.

Murraysburg.—Weather warm at present, but promising rain. Rainfall so far has been very slight, and veld is not in very good condition. Wheat and oat crops have been destroyed by drought, and fruit by frost. Cattle are in fair condition, slaughter animals scarce. Horses, mules, etc., in good condition. Sheep and goats doing well and practically free of scab. Ostriches fair. Pigs good.

Namaqualand.—We have had a light rainfall this month, not as good as last year. Weather generally hot and oppressive. Condition of veld fair. Wheat and oat crops are not very good. Fruit bad. Cattle in good condition; slaughter animals fair. Horses, mules, etc., good. Prices remain firm; horses, £25; mules, £30; and donkeys £10. Cape sheep fair, as are also goats. Ostriches indifferent. Pigs scarce.

Queenstown.—Prevailing weather hot, dry, and dusty, with cold south-west winds in the evenings. Rainfall very light and a long way below the average. Veld is in very bad condition. There is a good show of all kinds of fruits. Cattle in very poor condition. No slaughter animals. Horses, etc., are not doing well. Sheep in various conditions.

Riversdale.—Weather hot with winds from south-west. Rainfall for the month has been heavy and veld is consequently in good condition. Crops of all kinds in good condition. Fruits good and free from all diseases, etc. Livestock of all descriptions are in good condition.

Robertson.—Rainfall for this month has been very light and veld is in consequence getting very dry. Weather warm. Wheat, oat and barley crops very good and free from rust, etc. Lucerne thriving well. Fruits promising and healthy. Livestock of all descriptions doing well.

Somerset East.—Rainfall for the month has been very light and below the average. Weather variable. Veld is still very dry, but fairly plentiful. Heavy rains much needed to fill dams. Owing to the severe drought there have been no cereal crops. Mealies promise well. Fruit is making a very fair show, especially grapes. Livestock in fair condition. Ostriches in some parts are doing very well. Locusts have made their appearance in the northern portion of the district.

THE TRANSKEI.

For the month ending 30th November, 1904.

Bizana.—Fair rains have fallen in some parts of the district, but very little in the neighbourhood of Bizana. Harvest prospects are very bad. Although there is still a good deal of Mange in the district, I think decided progress has been made in its eradication during the past month. The troop of C.M.R. horses amongst which it kept breaking out again and again for months past, are now declared clean, and the whole village is pretty well clear of the disease. The natives in the locations are also taking great pains with their horses, and purchasing curatives in considerable quantities at the local shops, and with the incoming of summer and green grass, I hope the disease will shortly be got rid of.

Cofimvaba.—The want of rain is becoming serious, hot days and dry winds prevail, only 0·5 of rain fell this month and in consequence little if any ploughing has been done and the outlook for next season's crops of mealies and Kaffir corn will be very poor unless rain comes soon. All stock though free from infectious or contagious disease generally is suffering very much for want of grazing, the veld is parched and dry nearly all over the district.

Elliotdale.—During the past month only 0·26 inches of rain fell, and consequently very little ploughing has been done. Hot dry winds have prevailed throughout, and the veld is parched and dry. Stock has in consequence suffered and is in poor condition.

Flagstaff.—I believe the drought is now fairly broken. We have had 2·72 inches of rain during the past month and ploughing is proceeding throughout the district. In places the young crops appear promising, the pasturage is good, and stock are doing well.

Idutywa.—There is nothing to add to my report for the month of October last. During the month of November there has been no rain. Al stock is suffering and no ploughing can be done.

Libode.—I have to report with regret that the drought which is unprecedented in these parts still continues. Beyond a very few light showers there has been no rain during the past month. Moreover the hot weather accompanied by warm dry winds has now properly set in and the country is now resuming the brown parched aspect of mid winter. Unless we have rain within the next fortnight there will be no grain crop at all this season and as the natives have very little money and not much more stock—the greater part of their cattle having been disposed of last year to purchase food—they will have to face a worst starvation than they have ever had to in this part of the country. Extraordinarily good crops were reaped last season but with the usual improvidence of the native they have been wasted in making beer. The mortality amongst the small stock has considerably decreased as the few light showers brought on the new grass, but this is being burnt up, and it is feared that stock of all kinds will suffer very considerably if the dry weather continues.

Lusikisiki.—Very little rain fell during November, not sufficient for ploughing purposes and the outlook as regards next season's crop is serious, except in a few favoured portions of the District where occasional thunderstorms have fallen. But on the whole the month has been an exceptionally dry one. There has been only just enough rain to keep the grass going. Stock of all kinds however are doing well.

Maclear.—The weather during the past month has been hot and high winds have prevailed What little moisture there has been has speedily evaporated. Veld in variable condition. At present no sign of crops. Condition of large stock is fair. Owing to continuance of drought in some parts stock have had to be removed for grazing. Horses, etc. in good condition. Sheep and goats doing fairly well.

Matatiele.—The rainfall in this village amounted to 1·33 inches spread over eight days, and in some parts the veld has improved and been sufficient for stock; in others it is still very scarce, and farmers have been labouring under great difficulties. Very little cultivation has been done, and unless rains set in within the next few weeks there will be practically no harvest next year. A case of Anthrax and a case of Redwater were dealt with during the month, otherwise cattle are free of disease.

Mount Ayliff.—Very little rain has fallen here during the past month. Veld has improved since winter, but, owing to the drought, the grass is badly parched. Weather hot and dry. The season for sowing mealies and Kaffir-corn is rapidly passing, and outlook somewhat gloomy. Some ploughing has been done. Only a poor fruit crop is anticipated. Cattle are improving in condition on the new grass in spite of scarcity of rain. Horses, especially on the higher veld, are looking well. Prices rather low. Sheep and pigs doing well. Goats are now improving.

Mount Frere.—The drought continued during the early part of the month. Hot winds, which blasted the veld and dried up the springs, prevailed for the first week. On the 11th a refreshing storm passed through the district; on the 15th there was a nice soft rain, which fell for four hours, and was pretty general throughout the district; ploughing operations followed immediately, and were kept up for a week; no rain has fallen since, except a partial storm on the 26th and a few drizzles, consequently ploughing has again stopped and the veld going off. Stock is improving in condition. There is no disease, except Mange in horses. Slaughter stock scarce and unobtainable. The calving season has been fairly good.

Nqeleni.—The drought still continues, no rain having fallen within the month. The condition of the stock is very fair, considering the grass is so poor. No animal diseases have been reported.

Nqamakwe.—The drought last month was very severe, and no ploughing has been done, while the veld has a most wintry appearance and all kinds of stock are in very poor condition, and many losses in sheep and cattle have occurred. The ploughing season is passing, and unless rain falls within a few days, no harvest will be obtained next year. The district is infested with swarms of wingless locusts.

Port St. John's.—We are having continuous heat, Rainfall light; veld not as advanced as it should be. Want of good rain is delaying ploughing, and prospects of a crop next season are not bright.

Qumbu.—The weather has been very much the same as last month, very little rain falling and no ploughing done Stock is in fair condition and free from disease. A few locusts were seen in the district, but no swarm has been reported; evidently they have passed on or returned to more verdant pasture.

Tabankulu.—Rainfall light and not up to the average, but the drought seems to be breaking. Weather changeable, and veld in fair condition. Livestock of all descriptions in fair condition. Sheep improving.

Tsolo.—No rain fell during the past month, and no ploughing has been done. Both large and small stock are still dying from poverty, the pasturage being dry. No outbreaks of contagious diseases were reported.

Tsomo.—Drought has now existed for several months and remains unbroken. A few light showers have fallen at rare intervals but have been of no use whatever. Throughout the district grass is quite dried up and neither large nor small stock can derive any sustenance therefrom. The sun and the extremely hot dry winds that have prevailed have scorched the country, and horses, cattle, sheep and goats are alike poor and in many cases almost dying for lack of food. "Voetgangers" began to appear in myriads about the beginning of November and the district was quickly overrun with them.

Umtata.—The drought which has prevailed for the last eight months still continues. Slight showers in October and in the early part of November caused some little improvement in the pasturage but the heat and prevailing hot winds have completely dried it up, and stock owners are now searching in all directions for pasturage. No cultivation has taken place and the period within which the mealie crop may be planted is rapidly coming to an end There is every indication of a total failure of the mealie crop during the coming year. The position for the Natives is most serious, should the season subsequently prove favourable to wheat-growing, every assistance should be given to induce Natives to cultivate it and thus have something to avert the famine which is threatening more particularly as their buying powers have been so greatly reduced by the serious losses in stock.

Willowvale.—I have nothing to add to my last month's report. During the last month no rain fell and planting has not yet taken place. The veld is becoming very parched and unless rain falls there will be a failure of crops. Fruit trees have been rather largely pestered with moth, from which, in its chrysalis stage a frothy substance issues, and after inhabiting the tree for a short time the latter withers away. Tobacco spray has been used with some success.

Xalanga.—The drought continues with unabated severity. The scarcity of water is everywhere causing serious inconvenience. The pasturage is bad, and all large stock are in poor condition. Streams and springs in the district which have been noted for years past for their copious supply of water are now failing, and in some places drying up. All farming operations have been suspended.

NOTES ON THE WEATHER OF NOVEMBER, 1904.

By Charles M. Stewart, B.Sc., Secretary to the Meteorological Commission.

Cloudy, cool weather with excessive rainfall and prevalent Southerly winds in the West, exceptionally warm, dry, windy weather in the East, causing a continuance of the serious drought, a decrease in the number of Thunderstorms as compared with last month, a few local frosts and almost daily local fogs were the leading features of the weather of November.

Precipitation.—The rainfall of last month based on an average of 340 stations amounted to only 0·78 in. on four days, being 1·63 in., or 68 per cent. less than the normal. An examination of the accompanying Table shews that the rainfall was above the average only over the Cape Peninsula, the South-West, the West Coast and Bechuanaland, while the deficit over the rest of the country varied between sixty and ninety per cent. In fact the only Divisions showing any improvement on last month's rainfall are Basutoland, Bechuanaland and Natal as represented by Durban. The effect of the drought is being seriously felt all over the country, as evidenced by the observers' remarks, both in regard to cattle and the failure of agricultural operations.

Division.	Mean Rainfall. (1904).	Mean No. of Days.	Average Rainfall (1894-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
	ins.				ins.	
Cape Peninsula ..	2·03	8	1·71	6	+ 0·32	+ 19
South West ..	1·47	5	1·10	4	,, 0·37	,, 34
West Coast ..	0·53	3	0·48	2	,, 0·05	,, 11
South Coast ..	1·03	6	2·62	8	− 1·59	− 61
Southern Karoo ..	0·20	1	0·73	3	,, 0·53	,, 73
West Central Karoo ..	0·12	1	0·76	2	,, 0·64	,, 84
East Central Karoo ..	0·08	1	0·34	4	,, 1·26	,, 94
Northern Karoo ..	0·10	1	0·84	2	,, 0·74	,, 88
Northern Border ..	0·31	2	0·74	3	,, 0·43	,, 58
South-East ..	0·50	4	2·66	7	,, 2·16	,, 81
North-East ..	0·44	3	1·59	4	,, 1·15	,, 72
Kaffraria	1·02	7	2·64	8	,, 1·62	− 61
Basutoland ..	2·03	8	..	..	..	..
Orange Rivier Colony ..	3·32	10	..	..	..	..
Durban (Natal) ..	3·61	15	5·00	..	− 1·39	− 27
Bechuanaland ..	2·05	5	1·91	6	+ 0·14	+ 7
Rhodesia	2·15	9	..	..	..	..

On analysing the monthly totals we find that 51 stations reported "nil"; 190 had 1 inch or less; 63 between 1 and 2 inches; 25 between 2 and 3 inches; 7 between 3 and 4 inches, and only 4 over 4 inches viz. Waai Kopje, 4·68 ins.; St. Michael's 4·65 ins.; Ceres, 4·07 ins.; and Imperani, 4·42 ins. A confirmation of the prevalence of drought is found in the maximum falls in 24 hours, 274 out of 336 stations having maxima of 1 inch or less and only eleven over 1 inch, the largest amount being 1·75 ins. at Imperani, Ceres coming next with 1·62 ins. on the 1st. *Thunderstorms* were reported from only 219 stations on 27 days; these mostly of a local nature, except on the 10th,

—12th *Hail* fell at 24 stations on 14 days, chiefly on the 13th, a light fall of *snow* occurred on the 13th at the Oaks (Division Ceres), while *sleet* also fell on that date at one station.

Temperature, cloud and wind.—The mean temperature of all the stations during last month was, 65·4 or 4·4 warmer than October; the mean maximum temperature being 78 0 and the mean minimum 52‘9, thus showing a mean daily range of 25·1 (*i.e.* 1·6 more than last month.)

All over the West and South-West, the mean temperature was considerably below the average by from 1·3° at Simonstown to 5·2° at Ceres, both day and night temperatures being lower than usual; along the South Coast it was about the average, but inland it was considerably warmer than usual by amounts varying from 1° at Somerset East to 3·6° at Queenstown, the excessive warmth being mainly due to the day temperatures being higher than usual, while the night temperatures were about the normal. The mean warmest stations were Kenhardt and Kimberley, with a temperature of 73·9°, closely followed by Hopetown, with 73·7°, the mean coolest station being Ceres with 58 6°. The highest mean maximum was 91·7° at Kimberley, and the lowest mean minimum 45·5° at Ceres. The warmest days were from 7th to 12th inland, while along the Coasts the highest temperatures occurred on the 25th, 26th, 28th, and 29th, and the coldest morning was most generally that of the 14th, although at a few stations the minimum for the month occurred from the 3rd to the 6th. The mean of the absolute maxima was 90·5°, and of the absolute minima 43·5°, giving a mean monthly range of 40°. The highest temperature recorded was 12·35° during a hot wind on the 12th at Main, while the absolute shade minimum touched freezing-point at Hanover on the 14th, showing an extreme range of 91·5°. A few sharp frosts were reported during the month, causing considerable damage in some instances; these occurred altogether at nine stations on seven days.

The distribution of *Cloud* during the month was very much the same as during the previous two months, and showed a similar uniformity, although smaller in amount, the mean being only 40 per cent. It was mostly about 50 per cent. along the Coasts, with an inner belt of 30 to 40 per cent. and mostly about 20 per cent. in the interior. The highest percentage was 57, at Cape L'Agulhas, and the lowest 18 per cent., at Kenhardt. Local *Fogs* or *Mists* were reported from 76 stations on 25 days, most widely on the 21st.

Pressure was considerably above the mean in the West (by 0·04 in. at the Royal Observatory) and decreased Eastwards and Northwards, from 30·076 at the Royal Observatory to 30·012 in. at East London, 30·045 in. at Clanwilliam. Over the West the winds were mostly Southerly to South-Westerly, while along the coasts and inland they were mostly Westerly giving rise on several occasions to hot Berg winds; the mean force was 1·87 corresponding to a mean velocity of 12·4 miles per hour. *Gales* were reported on 7 days at 14 stations; and *Hot Winds* from 6 stations on 4 days.

A fairly graphic description of the wretched state of the country is given in the following notes by the observers.

Dunedin.—No rain, but stock in Nieuwveld still in splendid condition.

Boschfontein.—Locusts appeared on 11th and sharp frosts occurred on 14th, 15th and 18th, the combination resulting in the loss of all crops and garden stuff. Prospect appalling.

Middelburg.—23rd, great destruction caused in town and district by locusts, destroying crops and gardens.

Rietfontein (**Cradock.**)—Large swarms of locusts during the month and veld very dry. Water in Fish River only as far as Marlow and the run is only a 2 in. stream there. Locusts damaged small gum trees in Nursery.

Vosburg. - Month exceptionally cool for November. West winds almost every day, turning to South and South-West at sunset. Veld much dried up with wind. Locusts hatched out in great numbers but have apparently all died.

Waverley.—Very hot and dry month. Enormous number of locusts. Voetgangers. Locusts destroyed a fine crop of wheat.

Griquatown.– Drought continuing. Hot, dry, scorching wind in afternoons.

Alexandria.—Ripe crops are fine *i.e.*, barley and oats but wheat suffering from drought—otherwise healthy·

Fort Beaufort.—Severe drought throughout month.

FORT FORDYCE.—Drought with extreme heat, springs drying up and even strong springs have shrunk 90 per cent. Cattle dying from poverty.

CARNARVON FARM.—The driest and most windy month for 11 years. Result no crops and country covered with thousands of small swarms locusts, these will fly in January and complete the havoc and close the worst year on record.

HALSETON.—Hot and heavy winds and scorching generally throughout the month.

PHIPET PARK.—Worst drought ever known since 1862. Fountains dried up and stock dying in thousands. Locusts in millions.

WHITTLESEA.—25th, locusts in voetganger stage entered village notwithstanding efforts of inhabitants and cleared the village gardens.

COFIMVABA.—The district is in a very bad state owing to the drought. Cattle and sheep are dying of starvation and the natives are unable to plant.

FORT RIXON.—Early sown mealies dying for want of rain.

GROOT DRAKENSTEIN.—Cold cloudy month. Temperature 2.4° below average (5 years). Rainfall slightly above normal. Entire absence of South-easterly winds.

KENHARDT.—Large swarms of locusts in district. Diarrhœa bad in town, two deaths this week—25th to 30th.

QUEENSTOWN.—High winds very prevalent—often calm at 6 a.m., wind rising shortly after.

MOUNT AYLIFF.—Febrile attacks, some of the Influenza type, others accompanied by diarrhœa, others accompanied by pleurisy have been very prevalent, attacking nearly all the people in this village and neighbouring ones.

UMTATA.—All grass scorched by sun. Highest temperature 103°, 7th; 100° 12th, 102°, 21th, 101°, 30th.

TEMPERATURE, NOVEMBER, 1904.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Blaauwberg	67·6	54·0	60·8	72·0	4	50·0	18
Wynberg	70·7	52·2	61·4	84·0	25	43·5	14
S. A. College	71·2	53·3	62·3	84·5	25	45·0	14
Sea Point ..	68·7	54·2	61·4	77·1	26	48·1	14
Groot Constantia ..	68·0	52·2	60·1	82·0	26	45·0	14
Simon's Town .. .	71·0	56·7	63·9	79·0	25	49·0	14
Groot Drakenstein ..	74·7	50·7	62·2	88·0	25	42·0	14
Wellington (Hug. Sem.) ..	76·5	52·0	64·2	89·0	25	43·2	14
Robertson (Plantation) ..	79·9	50·1	65·0	95·0	25	38·0	13
Elsenburg	71·4	48·4	59·9	87·0	25	40·5	14
Ceres	71·6	45·5	58·6	82·0	9	40·0	2, 18, 19 & 29
Worcester	76·6	49·8	63·2	88·5	25	42·0	14
Hopefield	78·4	49·1	63·7	93·0	24	40·0	14
O'okiep	78·9	50·7	64·8	94·1	8	41·8	19
George (Plantation) ..	68·9	51·9	60·4	77·5	9	44·0	14
Knysna	69·8	52·6	61·2	81·0	25	41·0	14
Storms River	70·3	50·5	60·4	83·0	25	41·5	30
Heidelberg	76·0	53·7	64·9	88·0	28	42·0	14
Van Staaden's	72·3	53·6	62·9	83·6	29	45·5	20
Uitenhage	79·7	54·6	67·2	87·5	7	45·0	4
Cape St. Francis ..	69·4	57·3	63·3	74·0	3	50·0	25
Port Elizabeth ..	70·7	58·4	64·6	77·0	12	52·0	13 & 14
Cape L'Agulhas ..	67·9	55·2	61·6	74·0	11	48·0	15
Amalienstein	81·3	51·6	66·4	93·0	26	38·0	14
Somerset East	81·6	51·0	66·3	99·0	21	40·1	14
Wagenaar's Kraal ..	81·4	49·9	65·6	93·0	8	40·0	14
Murraysburg	82·4	50·0	66·2	95·0	25	38·0	13
Hanover	81·1	46·3	63·7	93·0	8	32·0	14
Kenhardt	90·4	56·5	73·9	102·0	8	46·0	14
Hope Town	89·2	55·2	72·2	101·6	9	39·0	14
Kimberley	91·7	56·2	73·9	103·0	8	43·9	14
Grahamstown	76·4	51·4	63·9	98·3	16	42·8	4
King William's Town ..	85·1	55·1	70·1	102·0	29	45·0	13
Sydney's Hope	73·8	52·9	63·3	84·2	29	45·0	14
Stutterheim	77·6	52·9	65·3	90·0	21	43·5	13
East London	72·6	60·1	66·3	82·0	12	51·0	14
Queenstown	87·4	52·7	70·1	99·0	7	45·0	14
Aliwal North	83·2	50·8	67·0	94·5	9	39·0	14
Rietfontein (Aliwal North)..	80·4	49·3	64·8	91·0	7 & 30	38·3	14
Mount Ayliff	82·5	56·3	69·4	102·5	7	48·0	4
Main	83·1	53·9	68·5	123·5	12	41·0	5
Matatiele	82·3	53·7	68·0	93·2	9	44·0	5
Umtata	82·6	57·0	69·8	103·0	7	47·0	6
Mohalies Hoek	81·6	50·1	65·9	95·0	10	40·0	3
Moyeni	93·1	52·0	72·5	102·0	9	42·0	14
Kuruman	88·2	53·5	70·9	96·5	9	43·0	18
Hope Fountain.. ..	86·9	60·5	73·7	96·2	23	50·8	1
Means	78·0	52·9	65·4	90·5	..	43·5	..
Extremes	..	..	..	123·5	12	32·0	14

RAINFALL, NOVEMBER, 1904.

I. CAPE PENINSULA:

	INCHES
Royal Observatory, (*a*) 12 inch gauge	1·21
Cape Town, Fire Station	1·45
Do South African College	1·8
Do Sea Point (Hall)	1·23
Do do. (Attridge)	1·15
Do Molteno Reservoir	2·10
Do Platteklip	2·78
Do Signal Hill	1·09
Table Mountain—	
Do Kasteel's Poort	3·82
Do Waai Kopje	4·68
Do St. Michael's	4·65
Bishopscourt	3·09
Kenilworth	1·88
Wynberg (St. Mary's)	2·22
Groot Constantia	2·32
Tokai	2·19
Simon's Town (Wood)	1·78
Do. (Gaol)	1·66
Robben Island	0·55
Fish Hoek	1·68
Cape Point	0·39
Durbanville	1·22
Woodstock	1·73

II. SOUTH WEST:

Eerste Rivier	1·23
Klapmuts	1·31
Stellenbosch (Gaol)	1·95
Somerset West	1·43
Paarl	2·02
Wellington (Gaol)	1·06
Groot Drakenstein	1·85
Tulbagh	1·81
Ceres	4·07
Caledon	0·36
Worcester (Gaol)	1·00
Hex River	0·96
Lady Grey (Div. Robertson)	0·09
Robertson	0·45
Robertson (Govt. Plantation)	0·53
Montagu	0·32
Rawsonville	1·89
The Oaks	1·75
Danger Point	1·89
Vijgeboom's River	2·28
Elgin Plantation	2·71
Elsenburg Agricultural College	1·03
Roskeen	1·10
Vruchtbaar	2·71

III. WEST COAST:

	INCHES.
Klipfontein	0·15
O'okiep	0·10
Springbokfontein (Gaol)	0·12
Concordia	0·15
Garies	0·01
The Towers	0·90
Dassen Island	0·48
Malmesbury	1·70
Piquetberg	1·55
Clanwilliam (Gaol)	0·27
Welbedacht	0·52
Lilyfontein	0·68
Anenous	0·07
Zoutpan	0·69

IV. SOUTH COAST

Cape L'Agulhas	0·61
Bredasdorp	0·46
Swellendam	0·57
Heidelberg	0·35
Riversdale	0·29
George	1·25
Millwood	1·77
Sour Flats	1·75
Concordia	1·06
Knysna	1·14
Buffels Nek	2·58
Harkerville	0·93
Plettenberg Bay	0·67
Blaauwkrantz	1·34
Storm's River	1·98
Witte Els Bosch	2·90
Humansdorp	1·25
Cape St. Francis	0·90
Witteklip	0·00
Van Staaden's (upper)	0·86
Do. (lower)	0·72
Uitenhage	0·46
Do (Iuggs)	0·44
Port Elizabeth (Harbour)	1·87
Shark's Rivier (Nursery)	1·62
Do (Convict Station)	1·89
Karnmelk's Rivier	1·03
Zuurbraak	1·29
Vogelvlei	0·58
Great Brak River	0·58
Kruis River	0·45
Armadale	0·05
Centlivres	0·24
Woodifield	1·25

V. SOUTHERN KARROO:

Ladismith	0·10
Amalienstein	0·17
Calitzdorp	0·10
Oudtshoorn	0·20
Uniondale	0·17
Kleinpoort	0·00
Glenconnor	0·65

VI. WEST CENTRAL KARROO:

	INCHES.
Prince Albert Road	0·20
Fraserburg Road	0·11
Prince Albert	0·67
Beaufort West	0·00
Dunedin	0·00
Nel's Poort	0·00
Camfer's Kraal	0·00
Lower Nel's Poort	0·00
Baaken's Rug	0·00
Willowmore	0·61
Steytlerville	0·00
Krom River	0·03

VII. EAST CENTRAL KARROO:

Aberdeen (Gaol)	0·04
Aberdeen (Bedford)	0·05
Aberdeen Road	0·08
Klipdrift, De Erf	0·00
Kendrew	0·03
Graaff-Reinet	0·00
New Bethesda	0·00
Roode Bloem	0·00
Patrysfontein	0·00
Toegedacht	0·13
Klipfontein	0·12
Pearston	0 06
Somerset East	0·12
Do (College)	0·15
Middleton	0·30
Corndale (Div. Aberdeen)	0·14
Cookhouse	0·43
Middelwater	0·00
Buffels Kloof	0·24
Glen Harry	0·00
Bloemhof	0·00
Roode Hoogte	0·00
Walsingham	0·00
Arundale	0 09

VIII. NORTHERN KARROO:

Sutherland	0·60
Fraserburg	0·19
Carnarvon	0·04
Wagenaar's Kraal	0·05
Victoria West	0 11
Britstown	0·00
Murraysburg	0·05
De Kruis	0·00
De Aar	0·00
Middlemount	0·00
Hanover	0·01
Philip's Town	0 00
Boschfontein	0 06
Petrusville	0 29
The Willows	0·00
Naauwpoort	0·00
Middelburg	0 00
Colesberg	0·10
Tafelberg Hall	0·00
Cradock	0·13
Do. (D/E Office)	0·11
Witmoss	0·00
Steynsburg	0·16

VIII. N KARROO—*continued.*

	INCHES
Quagga's Kerk	0·50
Tarkastad	0·13
Riet Vlei	0·23
Omdraai's Vlei	0·00
Varken's Kop	0·09
Culmstock	0·00
Doorskuilen	0·00
Hillmoor	0·08
Glen Roy	0·52
Loxton	0·11
Waverley	0·10
Scorpions Drift	0·00
Wildebeestkooij	0·17
Maraisburg	0·00
Rietfontein (Cradock)	0·09
Schuilhoek	0·09
Vosburg	0·13
Zwavelfontein	0·00

IX. NORTHERN BORDER:

Kenhardt	0·03
Van Wyk's Vlei	0 00
Prieska	0·00
Dunmurry	0·44
Griqua Town	0·08
Campbell	0·00
Douglas	0·10
Orange River	0·00
Newlands (Div. Barkly West)	1·16
Kimberley (Gaol)	2·15
Do. (Stephens)	2·40
Bellsbank (Div. Barkly West)	1·55
Barkly West	0·84
Upington	0·00
Trooilapspan	0·00
New Year's Kraal	0·04

X. SOUTH-EAST.

Melrose	0 06
Fairholt	0·63
Cheviot Fells (Bedford)	0·29
Bedford (Gaol)	0·83
Sydney's Hope	0·41
Adelaide	0·34
Atherstone	0·47
Alexandria	0 48
Salem	0·26
Graham's Town (Gaol)	0·65
Do. (Bact. Inst.)	0 74
Heatherton Towers near Graham's Town)	0·46
Fort Beaufort	0 05
Katberg	0·24
Seymour	0·14
Glencairn	0·80
Port Alfred	0·49
Hogsback	1·80
Thaba N'doda	0·30
Peddie	0·35
Cathcart	0·43
Keiskama Hoek	0 41
King William's Town	0·00
Do. Hospital	0·24
Stutterheim (Besté)	0·67

X. SOUTH-EAST—*continued.*

	INCHES
Dontsah	0·76
Mount Coke	0·46
Blackwoods	0·15
Albertvale (Bedford)	0·20
Kubusie	0·37
Blaney	0·32
Evelyn Valley	2·09
Isidenge	0·60
Perie Forest	0·42
Quacu Forest	0·62
Kologha	0·85
Komgha	0·74
Prospect Farm (Div Komgha)	0·55
East London, West	0·49
Fort Cunynghame	0·82
Bolo	0·42
Fort Fordyce	0·22
Daggaboer	0·65
Lynedoch	0·47
Sunnyside	0·43
Crawley	0·14
Forestbourne	0·86
Chiselhurst	0·71
Cata	0·20
Wolf Ridge	0·73

XI. NORTH-EAST.

Venterstad	0·00
Ellesmere	0·20
Molteno Station	0·24
Thibet Park	0·24
Sterkstroom	0·08
Do (Station)	0·10
Rietfontein	0·55
Hex's Plantation	0·56
Carnarvon Farm	0·12
Jamestown	0·35
Queenstown (Gaol)	0·21
Do. (Beswick)	0·19
Herschel	1·45
Lady Grey	1·12
Bolotwa, Contest	0·15
Lady Frere	0·11
Keilands	0·19
Barkly East	1·03
Lyndene	0·10
Whittlesea	0·24
Halseton	0·05
Sterkspruit	1·53
Blikana	2·47
Table Hill	2·16
Albert Junction	0·04
Hughenden	0·04
Glen Wallace	0·00

XII. KAFFRARIA:

Slaate, Xalanga	0·47
Ida, Xalanga	0·19
Cofimvaba	0·07
Nqamakwe	0·17
Main	0·11
Butterworth	0·31
Kentani	1·26
Maclear	1·29
Idutywa	0·22
Willowvale	0·84
Mount Fletcher	1·88
Elliotdale	0·26
Mqanduli	0·28
Matatiele	1·37
Umtata	1·00
Kokstad	1·97
Umzimkulu	1·32
Tabankulu	1·17
Somerville (Div. Tsolo)	1·60
Tsomo	0·12
'Bazeya	0·99
Qwebe	0·39
Mount Ayliff	2·05
Sotcba	1·24
Flagstaff	2·13
Insikeni	3·27
Wanstead	1·33

XIII. BASUTOLAND:

Mohalie's Hoek	2·29
Qacha's Nek	1·58
Moyeni Quthing	2·22

XIV. ORANGE RIVER COLONY:

Imperani	4·42
Reitz	2·7
Fairfield	2·78
Zuikerkop	[illegible]·33

XV. NATAL.

Durban, Observatory	3·61

XVII. BECHUANALAND:

Vryburg	1·54
Taungs	2·37
Setlagoli	3·95
Kuruman	0·02
Zwartlaagte	2·36

XVIII. RHODESIA:

Hope Fountain	3·52
The Range	2·66
Fort Rixon	1·22

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 10th December, 1904, ruling at the several centres named, is published for general information :—

CENTRE.	A	B	C.	D.	E.	F.	G.	H	J.	K	L.	M.	N.	O.	P.	Q.
	Wheat	Wheat Flour	Boer Meal	Mealies	Mealie Meal	Barley	Oats	Oat-hay	Potatoes	Tobacco (Boer Roll)	Beef	Mutton	Fresh Butter	Egg	Cattle (Slaughter)	Sheep (Slaughter.)
	per 100 lb.	per 100 lb	per 100 lb.	per 100 lb.	per 100 lb.	per 100 lb.	per 100 lb	per 100 lb	per 100 lbs.	per lb.	per lb	per lb	per lb.	per doz		
	£ s d.	£ s. d.	£ s d	£ s. d	£ s d	£ s. d	£ s d.	£ s. d	£ s. d.	£ s d	s d	s. d	£ s. d.	s. d.		
Aliwal North ..	0 12 0	0 14 0	0 13 6	0 6 6	0 9 0	0 10 0	0 9 0	0 8 6	0 10 0	1,6 to 4/-	0 9	0 9	0 2 6	2 0	£16	26/-
Beaufort West	0 11 6	0 17 0	0 16 0	0 8 0	0 10 0	0 10 6	0 10 0	0 5 0	0 8 3	0 0 8	7d to 8d	0 7	0 2 0	1 9	£20	25/-
Burghersdorp ..	..	...	...	...	...	...	...	0 6 0	0 7 9	...	...	0 8½	0 2 6	1 3	...	...
Cape Town ...	0 9 9	19 4	" " "	0 6 9	0 8 3	0 7 0	0 6 0	0 5 0	0 8 0	0 0 8	0 10	0 10	0 1 6	1 10	£16 to £20	25/-
Clanwilliam .	0 10 0	1 10 0	0 11 0	0 10 0	...	0 8 0	0 7 0	0 3 6	0 9 0	0 4 6	0 8	0 7	0 1 3	1 3	£10 to £14	20/-
Colesberg ..	...	...	...	...	...	...	...	0 8 0	0 12 0	...	...	0 7	0 2 3	1 3	...	...
Cradock .	...	...	0 13 0	0 8 0	.	.	...	0 7 0	0 8 0	0 0 6	..	0 7	0 1 11	1 9	...	...
Dordrecht ..	...	0 16 0	0 13 6	0 7 6	0 10 0	0 12 0	0 11 0	0 12 0	...	0 1 0	0 10	0 9	0 2 3	1 6	£10	22 6
East London ...	0 13 0	0 15 6	0 13 0	0 6 6	0 10 6	0 8 0	0 10 6	0 7 0	0 13 6	0 1 6	1 1	1 1	0 3 2	1 9	£22	35/-
Graaff-Reinet ..	0 .2 0	...	0 12 3	0 7 6	...	0 7 6	0 8 0	0 6 0	0 10 0	0 0 5	0 7	0 8	0 2 0	1 4	£14	25/-
Graham's Town	...	..	...	0 7 0	...	0 5 6	...	0 6 4	0 7 6	0 1 1½	0 10	0 9½	0 2 1	1 10	...	...
Kimberley ...	0 10 6	0 16 0	0 14 0	0 7 0	0 8 6	0 7 0	0 7 0	0 6 0	0 15 0	0 0 6	0 10	0 8	1 9	1 9	£13 to £15	23 - to 25 -
King Wm's Town	0 8 0	0 15 3	0 2 6	0 6 0	0 7 6	0 6 6	0 5 6	0 5 6	0 15 0	0 0 5	0 9	0 9	0 2 8	1 6	£16 to £18 10s.	25/- to 34/-
Malmesbury ...	0 8 6	· 12 6	0 10 6	0 6 6	...	0 7 6	0 7 0	0 4 0	0 8 4	0 1 0	0 8	0 9	0 1 3	1 6	£16	24/6
Mossel Bay ...	0 17 6	0 16 0	0 12 0	0 16 0	...	0 10 0	0 14 0	0 10 0	0 8 0	0 1 0	0 9	0 9	0 2 0	1 6	...	...
Port Alfred ...	0 12 6	1 0 0	0 15 0	0 8 0	0 15 0	0 6 0	0 6 0	0 2 0	0 6 0	0 0 9	0 6	0 6	0 2 0	1 6	...	...
Port Elizabeth	...	...	...	0 6 8	0 5 0	...	...	0 3 6	0 12 0	...	0 8	0 9	0 1 6	2 3	..	...
Queen's Town	0 8 3	0 13 0	0 12 3	0 6 6	0 7 0	0 9 3	0 8 6	0 6 6	0 13 0	0 2 6	0 10	0 9	0 2 9	2 0	£15 to £20	20/ to 2[illegible]/6
Tarkastad	0 12 0	0 13 6	0 12 6	0 12 0	0 12 6	0 11 0	..	0 8 6	0 10 0	0 1 6	0 8	0 8	0 2 6	1 6	£ 5	25/-
Vryburg ..	0 13 0	0 18 6	0 15 6	0 7 6	0 11 0	0 11 0	0 7 0	0 10 0	0 11 0	0 0 10	0 10	0 9	0 2 0	1 3	£15	30/-
Worcester ...	0 11 0	0 15 0	0 12 0	0 8 0	0 9 0	0 8 6	0 8 0	0 4 6	0 8 6	0 0 6	0 8	0 8	0 1 3	1 0	...	...

NOTE.—A blank space denotes "no transactions."

DEPARTMENTAL NOTICES.

Inspection of Live Stock arriving by Sea.

Regulations for the inspection of Horses, Cattle, and Pigs arriving from abroad are published for the guidance of both Exporters and Importers, to prevent disappointment upon arrival in this Colony.

HORSES, MULES, OR ASSES (Proclamation No 173 of 1900).—Glanders.—(1) No horses, mules or asses shall be allowed to enter this Colony by sea, until they have been examined by an Officer, authorised by the Government, to make examinations under the provisions of the "Animal Diseases Act, No. 27 of 1893," and certified by him to be free from Glanders, or any other infectious or contagious disease.

(2) Should the Examining Officer detect the presence of Glanders in any of the animals on board, all such infected animals shall be immediately killed, and their carcasses taken out to sea, sufficiently and properly weighted, and thrown overboard at a place indicated by the Port authorities.

(3) The remaining portion of any such shipment shall be allowed to be landed only on condition that they are removed to a quarantine station, approved of by the Government, and there subjected to a test with mallein by a duly qualified Officer, under direction of a Government Veterinary Surgeon, and detained for such further period as may be necessary.

(4) In the event of the test indicating the existence of Glanders, all animals so shown to be affected shall also be destroyed.

(5) All expenses of inspection, quarantine, destruction, and otherwise, shall be borne by the owner of such animals.

CATTLE (Proclamation No. 75 of 1900).—Tuberculosis.—1. The word "cattle" i these Regulations shall be taken to mean and include all animals of the bovine tribe.

2. No cattle shall be allowed to enter this Colony by sea until the conditions set forth in these Regulations are complied with.

3. If there shall be produced to the Officer authorised by the Government to make the necessary examination of cattle under the provisions of the Animal Diseases Act No. 27 of 1893, a certificate signed by a duly qualified Veterinary Surgeon of the country from which such animals have been brought, to the effect that they have, before being embarked, been submitted to the test known as the tuberculin test, and have not given any reaction indicative of the presence of tuberculosis, and if upon examination the Government Officer shall have reason to believe that they are free from any contagious or infectious disease he shall forthwith give a permit for their landing at any port or place in this Colony.

4. In the absence of a satisfactory certificate as aforesaid the cattle shall be removed to a place provided by the Government for quarantine purposes, and shall be subjected by a Government Veterinary Surgeon to the necessary testing by tuberculin to ascertain whether they are or are not affected with tuberculosis.

5. In the event of the test indicating the existence of Tuberculosis, the animals shall not be removed alive from the quarantine station but shall be destroyed there, and the owner shall be allowed to deal with the carcasses as he may think fit, provided, however, that the flesh shall not be used for human consumption unless the said officer gives a certificate that it is fit for that purpose.

6. All expenses of inspection, quarantine, destruction, and otherwise shall be borne by the owner of such cattle.

7. The foregoing Regulations shall not apply to cattle entering by sea from the Colony of Natal, so long as similar regulations remain in force in that Colony, nor

shall they apply to cattle imported solely for purposes of slaughter, provided that, before being landed, they shall be inspected by the officer referred to in the third section of these Regulations and declared to the best of his belief to be not unfit for human consumption, and the owner or importer shall sign and deliver to such officer an undertaking to the effect that none of such animals shall be used or disposed of for any other purpose than for *immediate* slaughter for food.

PIGS (Proclamation 214 of 1903).—The importation of pigs referred to in this Proclamation shall be permitted only upon the following conditions being complied with, namely:—

(*a*) Before shipment every owner shall obtain a Certificate from a duly qualified Veterinary Surgeon, setting forth that at the time of shipment the pigs are apparently free from the appearance of any contagious or infectious disease.

(*b*) The consignor shall sign a declaration on oath before a competent legal authority in the country from which export is to take place, to the effect that the pigs have been on the premises from which they are removed, prior to being moved for shipment, for at least 14 days, and that during such period no other pig has been introduced or received into or upon such premises, that the pigs are not affected with swine-fever, that they are not moved out of a swine-fever infected place or area, and further that the movement is not prohibited by any provision of law then in force in the country, state or territory from which such movement takes place.

(*c*) The Certificate and declaration hereinbefore referred to shall be delivered to any person authorised by the Government of the Colony of the Cape of Good Hope to make the examination required by the "Animal Diseases Act, No. 27 of 1893."

(*d*) Pigs which may arrive at any port or place in this Colony unaccompanied by the abovementioned certificate and declaration, will not be permitted to be landed, except at Cape Town, Port Elizabeth and East London, where arrangements for quarantine exist.

(*e*) Such quarantine as is in the foregoing section referred to shall not be for a less period than 28 days from the date of embarkation.

(*f*) Pigs, which may be found to be infected with swine-fever on arriving at any Port or place in the Colony, or which have been in contact during the voyage with pigs so affected, shall be dealt with in such manner as th Government may direct.

Regulations for Introduction of Cattle from Orange River Colony.

The following proclamation No. 217 of 1903 is published by command of H.E. the Governor.

Under and by virtue of the powers and authorities in me vested by the "Animal Diseases Act," No. 27 of 1893, and by the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare, and make known that, notwithstanding anything contained in Proclamation No. 139, bearing date the 15th day of August, 1901, it shall and may be lawful, from and after the date hereof, to introduce horned cattle into this Colony from the Orange River Colony, subject to the Regulations contained in the Schedule hereto.

Schedule to foregoing Proclamation.

(1) The person in charge of the horned cattle introduced under this Proclamation shall obtain and have in his possession a certificate in the form set forth in Annexure

"A" hereto, issued and signed by the Resident Magistrate or Special Justice of the Peace of the District in the Orange River Colony from which the cattle have come.

(2) The person in charge of such cattle is liable to be called upon to produce the certificate aforesaid to any Field-cornet, Justice of the Peace, Police Officer, or owner of land over which the cattle may pass or be passing.

(3) Any person who shall contravene any of the provisions of these Regulations shall, upon conviction, be liable to a fine, not exceeding Fifty Pounds Sterling, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding Three Months, unless such fines be sooner paid.

ANNEXURE "A."

I do hereby certify that the undermentioned cattle are free from infectious or contagious disease, and have not been in contact with infected animals, or, to the best of my knowledge and belief, come from or through a locality where any such disease is known to exist, viz.:—

Number and general description of cattle. ....
Place from which sent. ....
Owner's name and address. ....
Name of person in charge. ....
Place in Cape Colony to which cattle are being sent. ....
Signature of Resident Magistrate of District in Orange River Colony from which cattle have come. ....
Place. ....
Date. ....

Redwater or Texas Fever.

CATTLE FROM QUEENSLAND, UNITED STATES OF AMERICA AND MADAGASCAR.

REGULATIONS REGARDING THE IMPORTATION OF CATTLE FROM QUEENSLAND UNITED STATES OF AMERICA, AND MADAGASCAR.

1. Cattle from the abovementioned Countries may be landed at the Ports of East London, and Port Elizabeth, subject to inspection and issue of Clean Certificate at such port as provided by law.

2. Such Cattle may also be landed at the Ports of Cape Town and Mossel Bay, provided they are accompanied by a Certificate in the subjoined form

CERTIFICATE.

I do hereby certify that the undermentioned cattle are free from disease, and have not come from a locality in which the disease known as Red Water, Texas Fever, Tick Fever, or Tristeza is indigenous, and in which healthy cattle from non-infected areas are liable to become infected with the said disease.

Number and general description of cattle..............................
Place from which cattle have come. ....
Name of consignee at Cape Town or Mossel Bay..............................

* Signature ....
Title.
Place
Date ....

African Coast Fever.

PROHIBITION OF INTRODUCTION OF CATTLE FROM SOUTHERN RHODESIA.

By command of His Excellency the Governor the following Proclamation No. 139 1902, is published.

Whereas the disease known as Redwater is prevalent amongst cattle in Southern Rhodesia:

Now, therefore, I do hereby proclaim, declare and make known that, under and by virtue of the powers vested in me by the said Act No. 27 of 1893, the introduction of cattle from Southern Rhodesia into any part of this Colony shall be and is hereby prohibited, and that all cattle which may enter this Colony in contravention of this Proclamation shall be liable to be destroyed.

And I hereby declare that this Proclamation shall have effect from and after the date hereof, and shall continue in force until amended or repealed.

And I do strictly charge every Resident Magistrate, Field-cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Prohibition and Regulation of the Introduction of Live Stock in consequence of African Coast Fever in the Transvaal.

By proclamation No. 202, dated June 29, 1904, the following is enacted:—

It shall not be lawful, from and after the promulgation hereof, to introduce or cause or allow to be introduced into this Colony from any part of the Transvaal any of the following animals, that is to say:—Cattle, horses, mules, asses, sheep, goats, pigs, ostriches, dogs and cats; provided, however, that horses, mules, asses, dogs and cats, may, with the special permission of the Chief Veterinary Surgeon, or his authorised representative, be so introduced at such ports of entry as may from time to time be appointed for this purpose, if accompanied by a Certificate signed by the Principal Veterinary Surgeon of the Transvaal, or his authorised representative, to the effect that they have not come from or passed through any portion of the Transvaal proclaimed or known to be infected with African Coast Fever.

Any person introducing such animals or causing or allowing such animals to be introduced, or permitting such animals to stray into this Colony from the Transvaal shall be deemed to be guilty of contravening the provisions of the Proclamation and be liable to the penalties provided in Act 23, of 1893 (Animal Diseases Act, 1893); and all such animals entering the Colony from the Transvaal in contravention of the Proclamation are liable to be destroyed.

Rinderpest in Natal.

By proclamation No. 242 of August 5, 1904, the introduction of Horned Cattle from Natal to the Transkeian Territories, including Pondoland, is prohibited owing to the presence of Rinderpest in Natal, except through the following ports of Entry, viz., Riverside Drift, Border Gate, Umzimkulu Drift and Stanford Drift, district of Umzimkulu, and Middle Drift, Pondoland. They must then be accompanied by the following certificate:—

I hereby certify that the undermentioned cattle are free from infectious and contagious disease, and have not been in contact with infected animals or come from a locality where any such disease shall be known to exist.*

* To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the country from which the cattle are shipped.

Number and general description of cattle and place from which sent..

Owner's name and address..
Name of person in charge..
Place to which cattle are being sent..
Signature of Official of Natal Government...
Title...
Place...
Date..

Any horned cattle introduced in contravention of this proclamation are liable to be destroyed.

Rinderpest.

By command of His Excellency the Governor, the following Proclamation No. 85, of 1903, is published:—

Under and by virtue of the powers in me vested by the "Animal Diseases Act," No. 27 of 1893, and the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare and make known that, whereas the disease known as Rinderpest has appeared amongst cattle in the British Bechuanaland Protectorate, it shall not be lawful, from and after the date hereof, to introduce or to cause or allow Horned Cattle to be introduced into this Colony from the British Bechuanaland Protectorate.

And I do hereby further proclaim and make known that all Horned Cattle which may enter this Colony in contravention of the Proclamation shall be liable to be destroyed.

Swine Fever.

In view of the appearance of Infectious Swine Fever the symptoms of the disease are hereunder described for general information.

Any case coming to the notice of the Public should be at once communicated to the Resident Magistrate of the District in which the disease has occurred.

SYMPTOMS.

The symptoms of swine fever are not very distinct or specially characteristic at the commencement of the attack, or even during its course, except in acute cases.

The affected animals present a dull and dejected appearance, they move about very quietly and manifest a strong tendency to huddle together. If there is loose soil, manure, or litter available they will crowd together in that.

Their appetite is diminished, and although many of them continue to take a fair amount of food, until they become very bad, they eat in a languid and indifferent manner. Their temperature rises from about 105 to 106 degrees Fahrenheit. In one the temperature registered was 108·4, but it was hustled about a good deal in catching it, which may have raised its temperature a little.

The breathing is slightly quickened, but the increase in the respirations depends upon the extent of the lung lesions. There is also a cough, which is very much aggravated when the pigs are driven about in a kraal. In many cases the cough is the first indication of the infection. There is a hoarseness about the voice in advanced

In an acute attack the pigs fall off in condition very rapidly and manifest a weakness about the hind quarters which makes them walk with a wobbling staggering gait As the disease advances the listlessness increases and the hind quarters may become semi-paralysed.

The bowels are usually slightly constipated at the commencement, but diarrhœa generally supervenes towards the end.

The progress of the disease is very variable; in some acute cases it runs its course in two or three days, terminating fatally, while in others it may last much longer, but there has not been sufficient time to speak definitely of the course of the disease here yet.

In a number of cases there is more or less of a pink red discolouration of the skin. This does not usually occur until the disease is at its height, and in many cases there is no appearance of discolouration of the skin observable. When present the parts most affected are under the surface of the neck, the breast and the abdomen; the inside of the thighs and the ears. In acute cases these patches of discolouration extend and coalesce and assume a darker hue, the whole surface of the skin being more or less affected. In such cases the skin after death assumes a dark livid hue.

REMOVAL OF SWINE FROM THE DISTRICTS OF CAPE, STELLENBOSCH, PAARL AND MALMESBURY.

By proclamation No. 181, of June 10, 1904, swine are allowed to be removed out of he above divisions provided a permit for such removal be first obtained from the Chief Veterinary Surgeon.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice in Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from a contagious or infectious disorder, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and, in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to the Chief Veterinary Surgeon, Cape Town (telegraphic address: "Veterinus," Cape Town), the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the reatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residences or nearest Railway or Post Cart Station.

D. HUTCHEON,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 24th June, 1904.

Stations	*Names of Veterinary Surgeons.*
Aliwal North	H. T. Armstrong, M.R.C.V.S.
Cape Town	W. G. Pakeman, M.R.C.V.S.
"	S. Elley, M.R.C.V.S.
East London	R. W. Dixon, M.R.C.V.S.
Elsenberg	R. Paine, M.R.C.V.S.
Fort Beaufort	J. F. L. Lyons, M.R.C.V.S.
Grahamstown	T. Bowhill, F.R.C.V.S.
Kokstad	W. A. Hutchence, M.R.C.V.S.
Knysna	J. A. Robinson, M.R.C.V.S.
Malmesbury	C. Goundry, M.R.C.V.S.
Molteno	W. H. Chase, M.R.C.V.S.
Somerset East	J. D. Borthwick, M.R.C.V.S.
"	J. Spreull, M.R.C.V.S.
Uitenhage	G. W. Freer, M.R.C.V.S.
Vryburg	J. Neill, M.R.C.V.S.
Worcester	A. Goodall, M.R.C.V.S

Farmers' Apprentices, Dairy Assistants, &c

As inquiries are from time to time received from young men from abroad as to where they may serve apprenticeship or gain practical experience of farming in this Colony, before starting on their own account, the Secretary for Agriculture invites Farmers who are willing to receive young men of good character, for this purpose, to register their names with the Under Secretary for Agriculture, stating the class of farming they do, how many young men they are prepared to take, and for what period they would enter into an agreement.

It is not probable that these young men will be in a position to give more than their free services in return for the experience they will gain; that is, they will not be able to pay any fee; and they will look to receiving free board and lodging in return for their services.

Young men who are willing to engage themselves as Farmers' Apprentices in Cape Colony should register their names with the Under Secretary for Agriculture, Cape Town. The apprentice will gain experience in farming in South Africa, and have an opportunity for spying out the land before starting on his own farm.

It will be noted that the Apprentice will neither receive wages, nor pay a fee. He will get free board and lodging in return for his services, and at the same time acquire the experience he is in need of.

Applications for the services of Lady Dairy Experts and Dairy Assistants may also be made to the Under Secretary for Agriculture.

Importation of Trees, Plants, &c.

IMPORT REGULATIONS.

The following Regulations are gazetted under Proclamation No. 138, 1904, to take effect from September 1, 1904, all other regulations being cancelled.

1. The introduction into this Colony of trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs, and of fruit of all kinds, grown elsewhere than in South Africa is prohibited, save and except by sea through the Ports of the Colony or by Post.

2. The importation of the following articles is hereby absolutely prohibited:—

(*a*) Grape vines or any portion or fruit of any grape vine, with the exception of vines or portions thereof imported by the Government under such precautionary measures as it may deem necessary.

(*b*) Coffee plants or any portion thereof, with the exception of seed.

(*c*) Eucalypt plants or any portion thereof with the exception of seed.

(*d*) Coniferous plants or any portion thereof, with the exception of seed.

(*e*) Stone-fruit trees or any portion thereof, including seeds, that were grown or produced in any State, Province or Territory of the United States of America or the Dominion of Canada (or in any other country, in which either of the diseases known as Peach Yellows or Peach Rosette is found or reported to exist.

(*f*) Peach stocks and peach stones from any country whatsoever.

(*g*) Timber with the bark on, except scaffolding poles shipped from the Baltic Sea or from Canada.

3. The importation of any tree or portion thereof, with the exception of fruit, seed, seedling stocks of fruit trees for budding or grafting purposes, and blight proof stock for apples, shall be allowed only by special permission from the Minister for Agriculture. No permit shall be granted for the introduction of more than ten trees or one hundred cuttings of any one variety, nor shall permits be issued for more than an aggregate of one hundred trees or one thousand cuttings to any party during one year. For the purposes of this clause the term "tree" shall include any plant of the nature of a tree excepting garden shrubs. In case of dispute as to whether any plant falls under this restriction, the decision of the Minister shall be final.

4. All trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs and fruit of all kinds and their packages, cases, pots or other coverings, shall, before being delivered to the consignees, undergo an examination by an officer, appointed for that purpose to determine, as far as possible whether or not insects or plant diseases are present; and it shall be the duty of the consignees or his duly appointed agent to open the coverings and to afford every facility to the examining officer during the examination.

5. All trees and woody plants, together with their covering and packing material, shall as a precautionary measure against the introduction of injurious insects be fumigated at the expense of the consignee in the manner prescribed by and to the satisfaction of the examining officer; and if the examining officer deems the treatment expedient, he may extend it to all other plants and all parts thereof.

6. Should any article, in the examination provided for in Clause 4, be actually found to be infested in whole or in part with any insect or plant disease, the introduction of which would be prejudicial to the interests of the Colony, it shall, together with all other articles in the same receptacle, with all covering and packing material, be cleansed or disinfected by the consignee, or at his expense, in the manner prescribed by and to the satisfaction of the examining officer; and if not so cleansed or disinfected, or if any treatment at command shall be deemed by the examining officer, or found by him, to be inefficient for the absolute eradication of the insect or disease, or if the examining officer knows the insect or disease to be of specially dangerous character, the articles shall be destroyed without delay

7. Ordinarily, the inspection, and other treatment of consignments imposed by these Regulations, shall take place on the premises provided for the purpose by the Government at the port of entry; but special arrangements may be made with the Minister for Agriculture for the execution of all the provisions of Clauses 4, 5, and 6 on the premises of the consignee, when approved facilities, inclusive of a proper fumigation chamber are there provided.

8. On the examining officer being satisfied with respect to a consignment that all the Regulations and conditions herein set forth have been fully complied with, he shall issue a certificate to that effect to the consignee; and before the issue of such certificate the consignment shall be under his control for the purposes of these Regulations.

9. Articles subject to examination under these Regulations introduced into this Colony by post shall be intercepted and examined by an officer appointed for the purpose, and if found infected with any noxious insect or plant disease, shall be destroyed or cleansed at the discretion of such examining officer, and if requiring fumigation shall be so treated. All expenses of treatment shall be borne by the addressee.

10. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these Regulations, or from any process that may be considered necessary to cleanse or disinfect the articles, or to discover the existence or otherwise of any insect or plant disease.

11. These Regulations shall not apply to any consignment imported in bond for places beyond the borders of the Colony; nor to canned, dried or otherwise preserved articles in which there is no longer any plant life, with the exception of timber with the bark on.

Prohibition of the Importation of Grass Hay from Southern Rhodesia.

By Command of H.E., the Governor, the following Proclamation, No. 166, of September, 10th, 1902, is published in the *Government Gazette* :—

Under and by virtue of the powers and authorities vested in me by Act No. 9 of 1876. intituled "Act to regulate the introduction into this Colony of articles or things which by reason of disease or otherwise might be injurious to the interests thereof," I do hereby proclaim, declare and make known that whereas the infection of Redwate may be conveyed by means of Grass Hay, the importation of Grass Hay from Southern Rhodesia, or from the Bechuanaland Protectorate, shall be and is hereby prohibited; and that all Grass Hay which may enter or be introduced into the Colony in contravention of this Proclamation shall be liable to be destroyed.

And I do hereby declare that this Proclamation shall have effect from and after the date of publication hereof, and shall continue in force until amended or repealed.

And I strictly charge every Resident Magistrate, Field-cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Tobacco Seed.

A small consignment of the undermentioned varieties of Tobacco Seed has just been received from America, and is available for disposal, at the prices quoted :—

White Burley, Yellow Oronoko, Virginia One Sucker, Virginia Pryor, Blue Pryor and Maryland at 6d. per oz.

Connecticut Seed Leaf at 4d. per oz.

Long Leaf Gooch at 7d. per oz.

Havana at 8d. per oz.

Sumatra at 1/7 per oz.

The seed will be distributed in lots not exceeding 3 oz. of each variety, and applications, accompanied by a remittance for the amount due, must be addressed to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received.

Australian Salt Bush Seed.

It is notified for the information of Agriculturists that about 800 lbs. of Salt Bush Seed recently imported by this Department from New South Wales may be obtained in quantities to suit purchasers at 1s. 9d. per lb. (being one-half the cost of importation) upon application to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received, and must be accompanied by a remittance to cover cost (either Bank Draft, Postal Note, P.O. order or Cash.)

Guano.

It is hereby notified for general information that Guano Depots have been established at the following Railway Stations, viz.:—Malmesbury, Moorreesburg, Kalabaskraal, Piquetberg, Caledon, Paarl and Worcester, and that *Ordinary* guano from the Government Islands is obtainable thereat on payment to the local Station Masters of the price, viz.:—£6 10s. per ton of 2,000 lbs. or 13/- per bag of 200 lbs.; in addition to the charge for rail carriage from Cape Town. A bag of 200 lbs. is the smallest quantity supplied.

Applications accompanied by remittance for *Rock* Guano, for use within the limits of the Colony, the price of which is £6 17s. per ton of 2,000 lbs or 13/9 per bag of 200 lbs., delivered at the Cape Town Railway Station, should be made to the Superintendent the Government Guano Islands, Cape Town.

The following is the analysis of the guano:—

	Lime.	Potash.	Nitrogen.	Phosphoric Oxide.		
				Soluble in water.	Soluble in citrate solution.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Ordinary..	10·65	2·10	13·33	4·02	9·75	9·81
Rock ..	13·01	2·60	13·67	4·95	13·58	13·91

Returning Sheep from Orange River Colony.

The following regulations are issued under Proclamation No. 393, 1904, with regard to the return of sheep to the Colony from the Orange River Colony:—

1 All sheep introduced into this Colony from the Orange River Colony must either pass through one of the authorised Ports of Entry, viz.: Modder River (Division Kimberley), Honeynest Kloof, Witteputs, Belmont and Ramah (Division Herbert), Petrusville (Division Philipstown), Norval's Pont (Division Colesberg) Bethulie and Odendaalstrom (Division Albert) and Aliwal North (Division Aliwal North) or, if intended for immediate conveyance by rail, may be driven direct to the nearest railway station, from any point on the boundary line, between the Modder and Vaal Rivers.

2. All sheep so introduced must be accompanied by a certificate from a Government Inspector of the Orange River Colony that they are either free from Scab or have been dipped under his supervision. In the absence of such certificate, sheep must be dipped at one of the authorised Ports of Entry.

3. All sheep shall be again dipped on reaching their destination.

4. Any person contravening these Regulations shall upon conviction, be liable to fine not exceeding twenty pounds sterling.

Locust Birds.

In view of the ravages caused by Locusts from time to time, the attention of the Public is called to the necessity for protecting and encouraging the birds known as the Great and Small Locust Birds in all parts of the Colony. These birds are of great use to the Agriculturist, seeing that they prey so largely on locusts and other destructive insects which would otherwise leave the land bare of crops and pasturage.

It must be borne in mind that these birds may not be killed as they are specially protected by Law in all parts of the Colony up to and including 5th February, 1906 (Proclamation No. 44 of 1903), and any person wilfully destroying them is liable to fine or imprisonment.

The attention of Field-cornets, Headmen and of farmers generally is drawn to this matter, and it is urgently desired that everyone will do his best to see that the Locust bird is not shot or molested in any way.

Removal of Cattle, Sheep and Goats from Cape Colony to the Orange River Colony.

By proclamation of His Excellency the Lieutenant-Governor of the Orange River Colony, dated February 3, the introduction of horned cattle, sheep or goats from Cape Colony into the Orange River Colony is prohibited except in accordance with the attached schedule. Contravention of the regulations makes the person liable to a fine of £50 or three months with or without hard labour.

SCHEDULE.

(1) The person in charge of horned cattle, sheep and goats introduced under this notice shall obtain and have in his possession a certificate in the form set forth in Annexure "A" hereto, issued and signed by the Resident Magistrate, Veterinary Officer, Justice of the Peace or Inspector of Sheep of the District in the Cape Colony from which the cattle, sheep or goats have come.

(2) The person in charge of such cattle, sheep or goats is liable to be called upon to produce the Certificate aforesaid to the Inspector of Stock at any of the Ports of Entry mentioned in Annexure "B" hereto, or any Justice of the Peace, Police Officer or owner of land over which cattle, sheep or goats may pass or be passing.

ANNEXURE "A."

I do hereby certify that the herein specified (cattle sheep or goats) are free from infectious or contagious disease and have not been in contact with infected animals, and to the best of my knowledge and belief, have not come from or through a locality where any such disease is known to exist, viz:

Number and general description of (cattle, sheep or goats)................................

Place from which sent........

Owner's name and address..

Name of person in charge...

Place in the Orange River Colony, to which cattle, sheep or goats are sent..

Signature of Resident Magistrate, Veterinary Officer, Justice of the Peace, or Inspector of Sheep of the District in the Cape Colony from which (the cattle, sheep or goats) have come.

Place..

Date.......................................

Ports of Entry.—Frere Bridge, Colesberg Bridge, Bethulie Bridge, Norval's Pont Bridge, the farm "Karree Laagte," in the District of Jacobsdal; the farm "Dalton's

District of Fauresmith

Virus for Redwater or Texas Fever.

Virus for this disease is carefully prepared at the Government Bacteriological Institute, Grahamstown, and is supplied on demand to farmers at a cost of 1s. 0d. per dose.

Syringes suitable for this operation are supplied at 24/- each, and spare parts for the syringe can be had to replace those which may become broken.

Vaccine for Anthrax or Meltziekte.

Vaccine for this disease, consisting of two vaccines, a first and a second, is supplied from the Government Bacteriological Institute, Grahamstown, in tubes each containing five doses, at a total cost of 2/6 for the first and second vaccine together.

Syringes for the practice of this inoculation can be had on demand, at a cost of 9s. 0d.

Vaccine for Sponziekte or Quarter Evil.

Vaccine for this disease is supplied from the Government Bacteriological Institute, Grahamstown, at a cost of 2s. 6d. for five doses, which includes both the first and second vaccines.

Syringes for use in connection with this vaccine can be had on demand at a cost of 14s. 6d. each.

Regulations for Trout Fishing.

The following Regulations are issued under the "Fish Protection Act, 1899," by Proclamation No. 297, 1904:—

1. It shall be lawful to fish for trout in the Berg, Breede, Eerste, Hex, and Lourens Rivers, and in any of the Tributaries thereof, and in Princess Vley, in the Cape Division, between the first day of October in any year and the thirty-first day of January in the following year, both days inclusive; and in the Buffalo, Izeli, Keiskama and Kabusie Rivers, and in the Tributaries thereof, between the first day of October in any year and the thirty-first day of March in the following year, both days inclusive: provided the following conditions be observed, namely:—

(*a*) That no person shall fish for, capture, pursue, or destroy trout of any variety, without first having registered his name with, and obtained a permit from the Resident Magistrate of any of the following districts, viz.:—Cape Town, Paarl, Stellenbosch, Wellington, Worcester, Port Elizabeth, East London, King William's Town, and Grahamstown.

(*b*) That fishing shall be with rod and line only, and that artificial fly only be used as a lure; no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed; but this shall not be held to exclude the use of a legitimate landing net or gaff for landing the fish caught.

(*c*) That if any trout less than twelve inches in length be caught, it be forthwith returned to the water from which it was taken, with as little delay and as little injury as possible.

(*d*) That the consent of the owner or owners on whose ground it is proposed to fish be first obtained.

(*e*) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government official, or by the owner of the property on which the holder of the permit is fishing.

(*f*) That the permit be not transferable.

2. Riparian owners shall not require to obtain a permit to fish for trout in the open waters on their own property during the fishing season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1 of this Schedule.

3. Any person or persons contravening any of the foregoing Regulations, or any of the conditions thereof, shall be liable, on conviction, to a fine not exceeding twenty pounds sterling (£20) for each offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding three months.

Government Labour Bureau, Riebeek Square, Cape Town.

Men in search of employment, resident in Cape Town or Suburbs, should apply personally at the above Office between the hours of 10 and 12 in the forenoon and 2 and 3 in the afternoon. A list of vacant situations is posted in the window. In country districts applications should be made on the prescribed form which can be obtained at the Resident Magistrate's Office.

Notice to Employers.

The Government Labour Bureau undertake, free of charge, the preliminary selection of Candidates for vacant situations, whether in towns or on farms, in all parts of South Africa, the most minute attention being paid to antecedents and testimonials.

Employers should furnish full particulars of their requirements on the prescribed form whenever a personal visit to the Bureau is impossible.

Forms can, in the Country districts, be obtained at the Resident Magistrate's Office.

All letters and applications for employment or for the services of artisans, labourers, etc., should be addressed to THE DIRECTOR, GOVERNMENT LABOUR BUREAU, RIEBEEK SQUARE, CAPE TOWN.

NOEL JANISCH,
Under Colonial Secretary.

Netting for Fruit Trees.

The Board of Horticulture having decided to continue the importation of fruit tree netting, applications for such netting for the season 1905-1906 will be received by the undersigned not later than the 1st of April.

The Netting is sold per piece. Fly netting about 40 yards long by 70 inches wide, 8s. 6d. Bird Netting about 45 yards long by 13 feet wide, 15s.

C. MAYER,
Secretary, Western Province Board of Horticulture.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal.*

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Fruit Culture; Viticulture and Wine Making; Tobacco Culture; Forestry; Poultry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy and its Products by D. Hutcheon (2d); *Dairy Industry in Denmark (2d); Ready Reckoner for Cream Testing (1s.); *Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Common Blue Tick (1d.); Cabbage Aphis (1d.); Codling Moth in MadeiraFruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); Hessian Fly † (1d.); Insect Pests, their Origin and Means of Suppression (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d); *Peach Yellows (1d); Pear Slug, Paris Green (1d.); Remedy for Mest-wurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Tampans or Fowl Ticks (1d); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d); The Fowl Tick (3d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Legislation to exclude Plant Pests (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d.): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); Fumigation for Scale Insects (1d); Rijs Meeren and Hout Kappers (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Description of two new Gobiform Fishes (1d.); Description of a new South African Gasteropod (1d.); The Ocean and its Resources (1d); Trout Breeding and Stocking of Streams (1d.); Trout and Carp Breeding (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); Lecture on Fruit Culture (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (2d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (3d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and their treatment (1s.); Horse Sickness (2d.); *Heartwater (1d.); *Liver Disease among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); Transmission of Malignant Jaundice of the Dog by a Species of Tick (1d.); Wool v. Mohair (1d.); Wire Worm in Sheep, Goats and Ostriches (1d.); *International Conference of Sheep Breeders (1d.); The Eye and its Diseases (1d.): Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); Notes on the so-called Paralysis Tick (1d.

Viticulture.

*Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.)

Miscellaneous.

Game Seasons (1d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); Collect on Delivery (1d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.

NOTE.—All those marked with * are obtainable in Dutch and English.

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller reports for the month ending December 20th :—

Wool.—Since last report there has been a large turn-over, many good parcels in both Grassvelds and Karroos have changed hands at firm rates. The final news of the London Sales was not considered quite as satisfactory as was expected, and some lower quality parcels exhibited suffered a slight set back. Clips, however, which showed good character, fine quality and light condition, are eagerly competed for. Karroos have come in for a good deal of attention during the last couple of weeks, while light Grassvelds have maintained their value. The following prices may be quoted: For Super Grassvelds, from the Swellendam, Bredasdorp and Caledon districts, from 8d½. to 9d., one lot of Super Caledon realising up to 9¼d. per lb. Roggevelds from 7½d. to 8½d. Super Karroo Grease from 6½d. to 7¾d., according to yield. Super Light Grassveld Lambs realised up to 8¼d., while Karroo Lambs of light condition may be quoted from 6d. to 6¾d. per lb. Course and Coloured is firm at 4½d. to 4⅝d.

	s.	d.	s.	d.
Super Long Grass Veld Wool	0	8	0	9¼
Super Long Karroo Veld Wool	0	6¾	0	8
Medium Karroo Veld Wool	0	5	0	6¼

	s.	d.	s.	d.
Short and Inferior ..	0	4	0	5
Wool for Washing ..	0	4½	0	6
Snow-white Super to Extra	1	4¾	1	7½
,, Ordinary	1	2	1	5
Fleece Washed ..	0	9	0	10

Ostrich Feathers.—The news of the closing of the London Sales is to hand showing that best quality Wings, White Tails and Floss showed an improvement, while inferior Wing Goods, Blacks, Drabs, and Spadonas were weaker. Ordinary common quality generally found little favour with buyers.

	£	s.	d.	£	s.	d.
Super Primes	10	10	0	35	0	0
Firsts, Ordinary to Super ..	8	0	0	10	10	0
Seconds ..	6	10	0	7	10	0
Thirds ..	3	10	0	5	10	0
Femina (super)	7	0	0	10	10	0
Femina, Seconds to Firsts ..	4	0	0	6	0	0
Byocks (fancy) ..	5	0	0	7	10	0
Long Blacks ..	4	10	0	7	10	0
Medium Blacks	3	0	0	3	10	0
Short to Medium	0	10	0	2	10	0

	£	s.	d.	£	s.	d.
Floss ..	0	5	0	1	10	0
Long Drabs ..	2	10	0	4	10	0
Medium Drabs..	1	5	0	1	15	0
Short to Medium	0	10	0	1	5	0
Floss ..	0	2	6	1	10	0
White Tails ..	1	5	0	1	15	0
Coloured Tails..	0	5	0	1	10	0
Chicks ..	0	1	0	0	2	0
Spadonas ..	0	10	0	4	0	0
Inferior Black & Drabs, Short to Long ..	0	0	6	1	10	0

Mohair.—Reports from the other side are more satisfactory and a considerable business is being done at Home, in medium classes principally, although other classes are also enquired for. Parcels of Winter arriving are eagerly taken up and may be quoted up to 10¾d.

	s.	d.	s.	d.
Mohair, Firsts, Summer	0	10½	0	11¾
,, Kids.. ..	1	3½	1	4
,, Seconds ..	0	6½	0	9¾

	s.	d.	s.	d.
Mohair Winter ..	0	10	0	10¾
,, ,, Kids..	1	0	1	2

Skins and Hides.—Prices remain unchanged and there is a good demand for all classes at the old rates.

Buchu Leaves.—The market is dull at Home and parcels are difficult to move off.

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date, December 16 :—

Ostrich Feathers.—Owing to small stocks, there was only half a day's sale held this week, when the usual average assortment was offered. All good quality Whites and Feminas were in strong demand, prices being decidedly in sellers' favour. Ordinary

Whites and Feminas showed little change, Tails ruled firm, as well as Spadonas, but blacks and drabs were very weak, and prices in buyers' favour, especially long and medium. The total quantity sold on Public Market this week amounted to £1,660 19s. 0d, and weighed 894 lbs. 11 ozs.

	£	s.	d	£	s.	d.
Primes: Extra super				Special Prices.		
Good to super	9	0	0	11	0	0
Whites: Firsts	6	0	0	8	0	0
Seconds ..	4	0	0	5	0	0
Thirds ..	2	5	0	4	0	0
Feminas: Tipped and Grey ..	4	10	0	7	0	0
Seconds ..	2	0	0	3	10	0
Thirds ..	1	5	0	2	0	0
Fancy ..	4	0	0	6	0	0
Tails: White ..	1	5	0	2	5	0
Light ..	0	17	6	1	7	6
Coloured & Dark	0	4	6	0	14	6

	£	s.	d.	£	s.	d.
Blacks: Long..	3	5	0	4	15	0
Medium ..	1	10	0	2	10	0
Short ..	0	10	0	0	17	6
Wirey .	0	1	0	0	1	6
Floss ..	0	6	0	1	1	0
Drabs: Long ..	1	15	0	3	0	0
Medium ..	0	15	0	1	7	6
Short ..	0	2	6	0	6	0
Wirey ..	0	0	6	0	1	0
Floss ..	0	6	0	1	1	0
Spadonas: Light	0	17	6	2	15	0
Dark ..	0	12	6	1	12	6
Chicks ..	0	0	3	0	1	6

Wool.—This market continues very firm, but owing to limited stock and new arrivals, the amount of business done in the open market during the week, was less than last week the most important transactions being our sales of 700 bales, for which we obtained full current prices. On the Public Market yesterday prices showed no

Snowwhite Extra Superior ..	17½d	19d
Snowwhite Superior ..	16d	17d
Do Good to Superior	14½d	15½d
Do Inferior Faulty	13½d	14d
Grease, Super Long, well-conditioned, Grassveld grown, special clips	8d	9d
Grease, Super Long, well-conditioned, Grassveld grown ..	7d	8d
Grease, Super Long, well-conditioned Karoo Grown ..	6¼d	7d
Grease, Super Long, well-conditioned, Mixed Veld ..	6d	6½d
Grease, Light, faultless, medium, Grassveld grown.. ..	6d	6½d
Grease, Light, faultless, medium Karroo grown	5½d	6d
Grease, Light, faultless, short Karroo grown	5d	5¼d
Grease, Short, faulty and wasty ..	4¾d	5¼d
Grease, Coarse and Coloured ..	4½d	4¾d
Scoured, Coarse and Coloured ..	6½d	10½d
Free State Grassveld Grease, long and well-conditioned ..	6½d	7d
Free State medium grown, light, with little fault ..	5½d	6d
Free State short, faulty and wasty ..	5d	5¼d
Free State Karroo grown, long and well-conditioned ..	5½d	6d
Free State medium grown, light, with little fault ..	5d	5½d
Free State short, faulty and wasty ..	4¾d	5d

Mohair.—This Market remains active, and all odd lots of Winter and mixed O.R.C. hair arriving are eagerly bought at 10¾d. The stock now is confined practically to our holding of Summer and Winter Kids (about 300 bales). On the Public Market on Tuesday prices ruled firm.

Kids, superfine ..	1s	4d	1s	6d
Kids, ordinary ..	1s	2½d	1s	3d
Kids, seedy and mixed	0s	9½d	1s	0d
Superior Firsts ..	None offering.			
Ordinary Firsts ..	None offering.			
Long Blue O.R.C. Hair	None offering.			

Mixed Hair ..	0s	9½d	0s	10¾d
Seconds and Grey ..	0s	7d	0s	8½d
Thirds	0s	4½d	0s	4¾d
Winter	0s	10½d	0s	10¾d
Do. Kids ..	1s	0d	1s	1½d

Skins.—Sheepskins sold in bundles at 6d per lb.; Pelts at 3½d; Capes, 1s 4½d; damaged, 5½d each; Angoras, 5¾d, Shorn, 4¼d; damaged, 2¾d; Goat, 10d; damaged, 5d per lb; Springbok, 8d each.

Hides.—Sun-dried Hides sold this week at 7½d, and or damaged, 5¾d; Drysalted, 6½d; damaged, 5¼d, and Thirds, 3½d.

THE

Agricultural Journal.

OF THE CAPE OF GOOD HOPE.

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CONTENTS.

PAGE.
NOTES—(*Illustrated*) 156—162

Agricultural Shows—Netting for Fruit Trees—Poison in the Midlands—The "Bee Pirate" again—"Alfalfa" and Lucerne—Correction—The Cost of Jackal-proof Fencing—Locust Destruction—Mules Killing Young Foals—A Colonial-made Spray Pump—Traumatic Pericarditis caused by a piece of Wire—Pressure—The "Stonedale Late" Orange—Sluits and Sluiting.

FARM AND VELD—(*Illustrated*) 163—170

Fencing for Rivers and Sluits—A Queenstown Garden Trouble (*Adoretus ictericus*)—Springs Alongside Rivers—Accumulation of Fine Sand in the Intestines of Young Ducks and Chickens—Warts on Poultry.

EXTRA-TROPICAL FORESTRY, by D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town (*Illustrated*) ... ... 171—185
SMALL FOWL YARDS, by F. Arnold, Pretoria ... ... 186—189
IRRIGATION IN THE NORTH-WEST, by W. B. Gordon (*Illustrated*) ... ... 189—205
THE ROYAL AGRICULTURAL SHOW OF ENGLAND, 1904 (*Illustrated*) ... ... 207—219
THE EXHIBITION—GOVERNMENT PRIZES ... ... 220—232
RURAL CAPE COLONY, No. X., by F. D. MacDermott (*Illustrated*) ... ... 233—245
PAARL AGRICULTURAL SHOW ... ... 246—249
TRANSVAAL PLANT IMPORTATION REGULATIONS ... ... 250—255
LOCUSTS IN THE COLONY ... ... 255—258
SOUTH AFRICAN MADE WATER DRILLS (*Illustrated*) ... ... 259—261
AGRICULTURAL SHOWS IN 1905 261
THE ORIGIN OF IGNEOUS DYKES AND THEIR RELATION TO THE UNDERGROUND WATER SUPPLY OF CAPE COLONY, by Claude Warner ... ... 262—264
OUTBREAKS OF INFECTIOUS DISEASE IN DECEMBER, 1904 265
A LATE CAPE ORANGE (*Illustrated*) ... ... 266—267

CORRESPONDENCE—(*Illustrated*) 269—282

A Working System of Locust Destruction—Another Plan for Locust Destruction—A Locust Trap—Fluke in Sheep—The Molteno Cattle Disease—Bone Meal and Lamziekte—Lime and Sulphur Dip—Stockholm Tar and Sheep Dips—Jumper *versus* Diamond Drilling—Ragwort Poisoning—Farriers' Licences—The Working of Syphons, Information Wanted—Manuring Sweet Potatoes—Wild Animals in Captivity—A Crop Failure—Fungous Disease on Apricots—Sunflower Seeds—How to Tame Bees.

RURAL REPORTS ... ... 283—286
NOTES ON THE WEATHER OF DECEMBER, 1904 ... ... 287—289
RAINFALL RETURNS FOR DECEMBER, 1904 ... ... 290—292
CURRENT MARKET RATES 293
DEPARTMENTAL NOTICES ... ... 294—310
DEPARTMENTAL PUBLICATIONS ... ... 311—312
THE PRODUCE MARKET ... ... 313—314
INDEX TO ADVERTISERS ... ...lxiii—lxiv

NOTES.

Agricultural Shows.

The show season has opened well in the Western Province, but things are looking so black in the East that every one along the Border has been postponed. East London, where an excellent new showyard has been arranged with permanent buildings that vie with Port Elizabeth, has been compelled to bow to the inevitable. King William's Town, with an extended prize list, has followed suit, while Queenstown gave up the attempt long ago. This indicates a very serious state of things, and means that the Rosebank show will be minus some of its features as well, for the Eastern Province should have been well represented in such classes as sheep, wool, Angoras, mohair, ostriches and feathers.

Paarl opened the ball with a most successful function, that showed some advance on last year. Stellenbosch came next, also an excellent show, well up to previous standards and promising further advances. During February some of the most important fixtures are set down. Robertson is due on the 8th, Worcester on the 15th, Bredasdorp on the 16th, and Rosebank on the 22nd, 23rd and 24th. This is a fairly full programme, and should keep our Western friends busy.

March and April are devoted to the Eastern Province, which so far is represented only by Barkly East, Grahamstown and Port Elizabeth. Bloemfontein, we are sorry to see, has dropped out on account of the drought.

Netting for Fruit Trees.

The attention of fruit-growers is drawn to the announcement of the Secretary of the Western Province Horticultural Board asking for orders for bird and fly netting for next season. Same should be addressed C. Mayer, Sec. W.P. Hort. Board, Stellenbosch.

Poison in the Midlands.

Mr. J. M. P. Bowker, hon. sec. Midland Farmers' Association, writes :—At a meeting held by the Midland Farmers' Association in May, 1904, members pledged themselves to lay out poison (not less than 20 pills) on the first Wednesday in every month. The numbers reported to me by members up to the end of 1904 are as follows :—Red Jackals, 109; Maanhars, 12; Lynxes, 9; Leopards, 1.

The "Bee Pirate" Again.

A correspondent writes, asking if anyone can tell him how to get rid of the "bee-catcher" from his hives?

"Alfalfa" and Lucerne.

Great confusion arises sometimes through the use of local names for common plants, and in none is the confusion more confounded than in the application of the two names "alfalfa" and "lucerne." Some months back a leading Colonial daily paper was so misled as to seriously ask the Government why no attempt had ever been made to import that valuable fodder plant "alfalfa" to this country. Now we have a correspondent writing from the Orange River Colony, asking us to decide a wager, the subject of which contains the old conundrum: Is there any difference between alfalfa and lucerne? Once again we emphatically reply in the negative. There is no difference and there can be no difference for these terms are local names for the same plant known botanically as *Medicago sativa*.

Correction.

The article on "Glanders in Man" published in the December issue was credited, by an oversight, to the *Veterinary Review*. The correct source was the *Veterinary Record*, to which we apologise for the mistake.

The Cost of Jackal-proof Fencing.

Mr. J. A. Harty, of Stutterheim, who was in town in connection with the Agricultural Commission maintains that Jackal-proof fencing can be erected far cheaper than the costs given by Mr. T. T. Hoole in his recent paper. He assures us that he has put up a 12 strand barbed wire fence at a cost of £40 14s. 6d. per mile when refencing on standing poles. He works out the cost this way.

	£	s	d.
33 rolls barbed wire No 14 gauge at 15/8 each ...	25	17	0
2 rolls No. 8 plain at 13/ each	1	6	0
1½ rolls No. 12 plain at 14/ each	1	1	0
Labour	8	10	0
Lacing	4	0	6
	40	14	6

This fence took nine days to complete the mile. The wire he imported himself, and his son took charge of the work. Even making liberal allowances for poles etc., these figures are far below those quoted by Mr. Hoole.

Locust Destruction.

Our correspondence pages this month contain several references to locusts and methods of destruction, which are highly interesting reading. Next month we hope to be able to publish an exhaustive illustrated article now in course of preparation by Mr. C. W. Mally, Acting Entomologist, which will cover the ground so far as remedies are concerned, and suggest some new ones that are considered an advance on present methods.

While on this subject we may mention that a correspondent deeply interested in the subject of locust destruction writes that he obtained a Success Spray Pump for the soapy water cure, and gives it as his opinion that this pump is quite useless, the spray being much too light. As these are the pumps issued by the Government this criticism was passed to the Acting Entomologist (Mr. C. W. Mally), who offers the following comments :—

"Those who have had the most experience in spraying are the first to admit that no one pump serves all purposes. They are all cautious about making sweeping condemnations. In certain circumstances the 'Success' type of pump is very useful. In others it is a mere plaything. It is a splendid pump in its place: *i.e.* for light work in a small garden, or around buildings, or for certain experimental work where you are dealing with small quantities. In locust work, with small swarms, or where the swarms are young and the whole lot clustered in a few bushes, the 'Success' pump does very well, for it is the work of a moment to destroy a swarm of that kind when you once find them and get the necessary material on the spot. After the swarms are older (say in the fourth or fifth stages) and cover the bushes over a large area when they bunch up for the night, the "Success" pump is too light.

"Not that the pump is at fault, but simply because it is being put to a use for which it was never intended. For large swarms in the veld it would certainly be an advantage to have a stronger pump,—say of the type of Gould's 'Pomona' (costing about £4 10s. in Cape Town) with at least two leads of hose. With that pump properly fastened in a cask or barrel and mounted on a convenient spray cart, Scotch cart or waggon, we can cope with large swarms of voetgangers. There is hardly a farmer who would not gain by investing in a pump of this kind, for it would not only be available for locust destruction, but also for spraying his fruit trees, vines, potatoes, etc., besides whitewashing fences, buildings, etc.

"There are numerous makes of pumps of this kind which might serve every purpose. Some are more expensive than others. Until we have tried them in a practical way, it would be ill-advised to name one pump specially. I simply mention the Gould's 'Pomona' as a standard of comparison, for it combines the element of moderate cost, strength, efficiency, and portability. I myself should like to see the compressed-air sprayers given a thorough trial. I believe we can devise a very simple type which will serve nicely for locust destruction, for the spraying that is required is the easiest possible from the standpoint of the pump. Power is all you want, and an air cushion can furnish that as well as a man and pump. The drawback to a pump of this kind is that it will be of little use for some of the more difficult spraying operations, and hence, in the long run, a pump of the "Pomona" type will be the better investment, for it will render good service in different ways for years.

The various types of garden syringes are open to the same objections as the "Success." The coarser, or "heavier" sprays (as from an ordinary "rose"), unless under high pressure, are very wasteful. I doubt whether or not we will find anything better than the "Vermorel" or the "Bordeaux" nozzle when properly adjusted, for they thoroughly wet the locusts with the least amount of liquid. From the standpoint of expense this must not be forgotten. For spraying plants with poisons which kill the locusts when they feed, the coarse or "rose" spray is worse than useless, because it is so wasteful without adding a counter advantage. The pump question can easily be settled by a practical test. But the question of transport is a much more serious one. When once the spraying materials have been brought to the scene of conflict, the question of application is simply a matter of arranging details to meet local conditions.

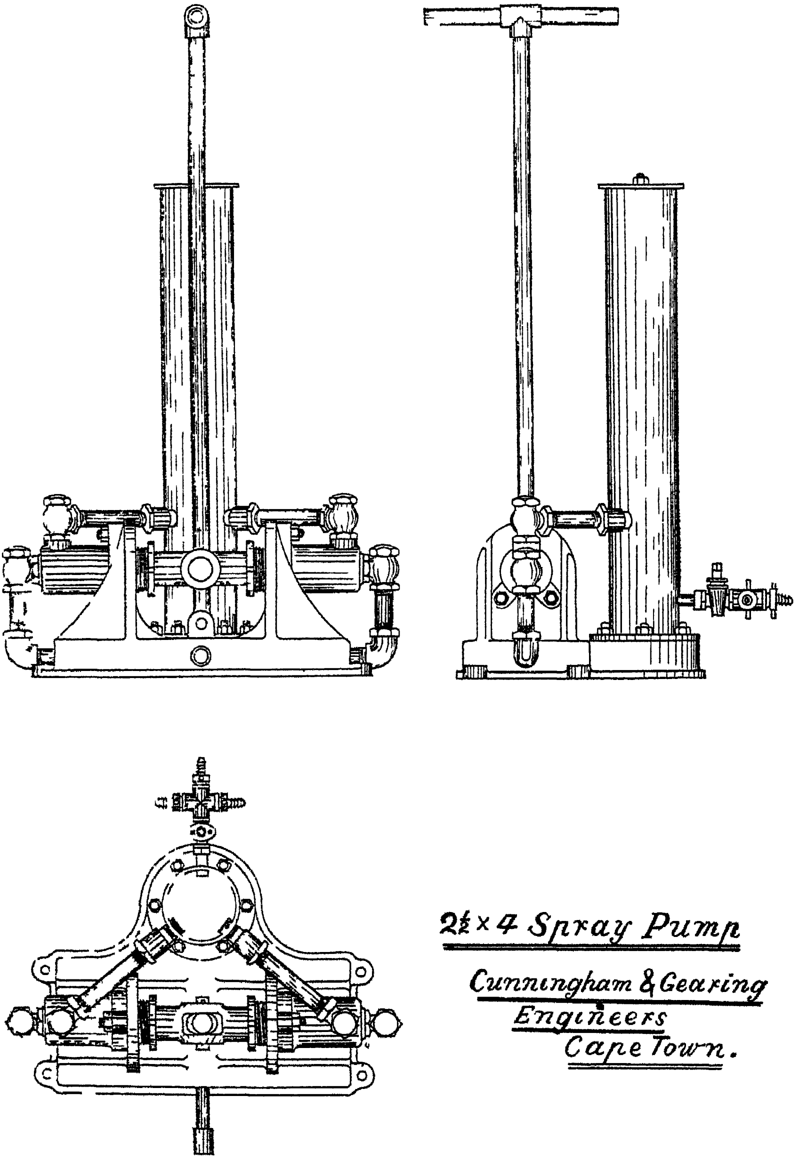
Mules Killing Young Foals.

"Persevere" writes:—Some time ago one of my mares (which was running in the veld along with my horses and mules) foaled (a horse foal). On going to her I found the foal injured, fatally as results shewed, and as I could not account for it in any other way, I concluded the mules had done it. Speaking with a neighbour, he informed me that he had often seen foals killed in that way. Whether this is fact or fiction I cannot say, but the foal in this case was dead right enough. Should this be a usual occurrence, can you tell me: 1st. Would the same apply to mule foals? 2nd. How old should the foals be before allowing to run with the mules and horses?

It is always dangerous to allow mares which are near foaling, or with young foals at foot into a camp with mules. The mare mules rush about after the young foals, not with the direct object of injuring them, but evidently with the morbid desire of getting them to leave their mothers and becoming attached to the mules. It is during this fighting and rushing about of the mares and mules that the foals get injured. After a foal is some weeks old and able to scamper about, the danger is not so great. But as a general rule no mules should be allowed in a camp with mares and foals.—D. H.

A Colonial Made Spray Pump.

Our attention having been drawn to a spray pump manufactured by Messrs Cunningham & Gearing, of Cape Town, we obtained the following particulars of same. The pump has worked very satisfactorily in some of the larger orchards, and is highly spoken of by some of the leading Western fruit growers. This pump has two



brass plungers set opposite each other in a cast iron frame, operated by a lever between the two; one plunger guiding the other. The air vessel is a steel cylinder of ample capacity. The pump has been designed with a view to simplicity, and will be found to possess several advantages over those in ordinary use. All the valves can be seen by simply unscrewing the caps. There are only two working joints, and these will stand any amount of wear, as they are turned and fitted like an engine joint, and compare favourably with the usual quarter-inch flat iron joint with a small bolt put through, and which is quite slack at the end of one season's use. There are no leathers to dry out and cause trouble. The pump is packed with soft flax or cotton packing, and will last for years, simply screwing up the glands when required is all that is needed. There is no wood used in the construction, and the plungers require no guides. For wear and tear and exposure to all weathers. we are confident that the pump will give every satisfaction.

Traumatic Pericaditis Caused by a Piece of Wire.

C. E. Pohl, of Kareepan, writes:—I enclose a piece of rusted wire found in the heart of a heifer that died two days ago. I noticed that she was stiff for the last two weeks, and the last two days she stood quite still on one spot absolutely refusing to move or lie down until she died. Now, can you or any of your readers explain how the wire got there?

The Chief Veterinary Surgeon remarks on this:—Ruminants, especially cattle, are very fond of chewing and swallowing all sorts of substances, more especially where they have a craving for bones and other animal matter, such as shoes, reims, saddle cloths, and even wearing apparel, and along with these they are very liable to swallow pins, needles, nails, or pieces of iron wire.

Cases also occur amongst dairy cattle which are fed in the stable, due to such foreign bodies getting in the bran or grains, which the cows usually swallowed greedily, without any mastication. When any such sharp pointed foreign body is swallowed it usually becomes lodged in the second stomach, or klein pens, and by the muscular contraction of the stomach and the movement of the food, the point becomes fixed in the wall of the stomach, and most frequently on the side next to the diaphragm, or muscular membrane dividing the abdomen from the chest. When once the point of this sharp body gets inserted into the wall of the stomach, the muscular contraction of the stomach walls, and the expansion and contraction of the chest and abdomen in the act of respiration, tends to force the foreign body in a forward direction, first through the stomach wall, thence through the diaphragm, onwards between the lungs right into the pericardium, or membrane covering the heart, where it causes acute inflammation, followed by a great thickening of the heart-bag, and an effusion of putrid inflammatory matter, which ends in death. The symptoms being more or less similar to those described by Mr. Pohl, I need hardly state that there is no satisfactory method of treatment available; and if the case were clearly diagnosed, the best plan would be to kill the animal, and dress the carcase which would be quite healthy.

Pressure.

Several letters and other contributions are unavoidably crowded out of the current issue. We would again remind contributors to forward matter as early in the month as possible. It must be obvious to all that the publication of a journal the size to which this has attained calls for a great deal of work which must be handled early if the whole of the large issue is to be posted on the 1st of each month. We therefore once more prefer a request for consideration in this direction.

The "Stonedale Late" Orange.

Mr. Henry Meyers of Simondium, is to be congratulated upon being the means by which the "Stonedale Late" Orange is to be made known to the world. He has always maintained that South African varieties, particularly of citrus fruits, if thoroughly exploited would be found to equal most of the best among those imported, and in the "Stonedale Late," which has been thriving for about half a century in the Cathcart District, his words are more than justified. There must be many other valuable varieties of fruits in this Colony which, if only better known, would be propagated more widely and give more reliable results than many of those brought in from abroad.

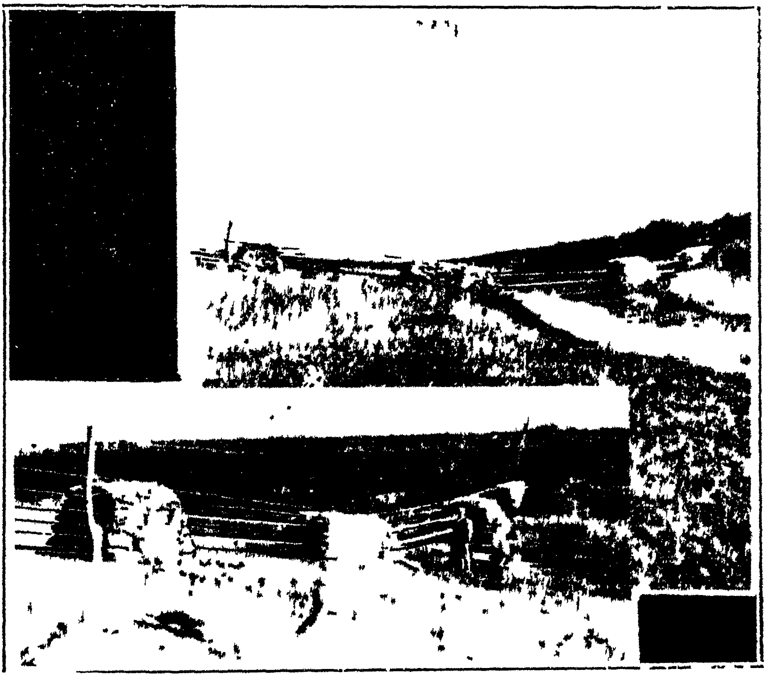
Sluits and Sluiting.

Interest in the subject of sluits and sluiting shows no sign of slackening, we are pleased to state. Next month some more contributions will be published in the *Agricultural Journal* with illustrations showing the ravages wrought by the erosion of the soil through sluiting, by Mr. Geo. Dugmore of Indwe, with recommendations and suggestions for prevention supplied by Mr. E. R. Bradfield. This with some further critical notes, should carry the subject another useful stage forward. As the fullest information is desired on the subject we cordially invite anyone who has had experience of the subject—particularly in the handling of preventive measures—to forward their views for publication.

FARM AND VELD.

Fencing for Rivers and Sluits

We have published from time to time a good many serviceable forms of fencing for rivers and sluits, but the one shown in the illustration accompanying this seems to be the most substantial that has, so far, come to our notice. The photograph represents a fence across the Little Brak River, on Mr. W. R. Southey's farm, at Schoombie. This river comes down with great force at times, and nothing but a very substantial structure could keep a fence in position. The stone banks are held in position by laced wires securely anchored in the bed of the stream, the rails are old railway metals embedded deeply into these banks. We believe the idea originated with Mr. Southey, and is most effective. The want of a strong fence across rivers and watercourses occasions a good deal of loss to ostrich and stock farmers at times, and this plan should prove useful to those who do not mind a little trouble in order to complete a permanent work.



A Queenstown Garden Trouble—*Adoretus ictericus.*

Several correspondents have drawn attention to the presence in Queenstown gardens of a beetle which is doing considerable damage to roses, vines, apples, plums, and other fruit trees. They are described as a "Khaki beetle," and get to work during the night, perforating the leafage and thus injuring the fruit crops. The specimens which have been forwarded have been identified by Mr. Peringuey, Assistant Curator and Entomologist of the South African Museum, as *Adoretus ictericus*, Burmeister. We have not received many complaints of injury by this species, but are quite prepared to believe the seriousness of the damage which it is reported to be doing, for it comes from a family of beetles (Scarabæidæ) that has long since succeeded in establishing an unsavoury reputation for causing mischief in agricultural matters throughout the world.

Although the life history of this species has never been traced, our knowledge of the habits of certain other species enable us to say with a fair amount of confidence that the eggs are deposited in the ground, and that the resulting "grubs" come to maturity in the soil by feeding on the roots of plants. What length of time will be required or what plants will be attacked, it is impossible to say. Very little can be done to combat them in the grub stage. As a matter of fact, they usually pass unnoticed until they mature, transform to the adult (*i.e.*, beetle) stage, emerge from the ground and begin feeding on the foliage. Just how long they live as beetles is not known—probably several weeks. As soon as they have fed up sufficiently, they mate, and in a short time the eggs for the next generation are deposited, after which the beetles soon die.

The following methods for destroying them are suggested:—
Fowls may be a great help, if they are available, and can be given the run of the orchard or garden. But the fact that the beetles feed at night shields them very greatly, for the fowls will have to hunt them out of the soil or from under the leaves, etc., under which they have secreted themselves.

Hundreds of them can be caught by placing a sheet of canvas under the tree after they have begun feeding. Then by jarring or shaking the tree vigorously the beetles drop off and can be destroyed. When a quantity has been collected they can be destroyed either with paraffin or else scalded with hot water.

If it is *attracted* to light (as many species in this family are), a trap—made by suspending a lantern immediately over a tub or large basin containing a little water and paraffin—will render good service. On coming to the light they usually try to settle, and in doing so drop into the film of paraffin on the water. Although paraffin will not kill them instantly they will succumb in a very short time.

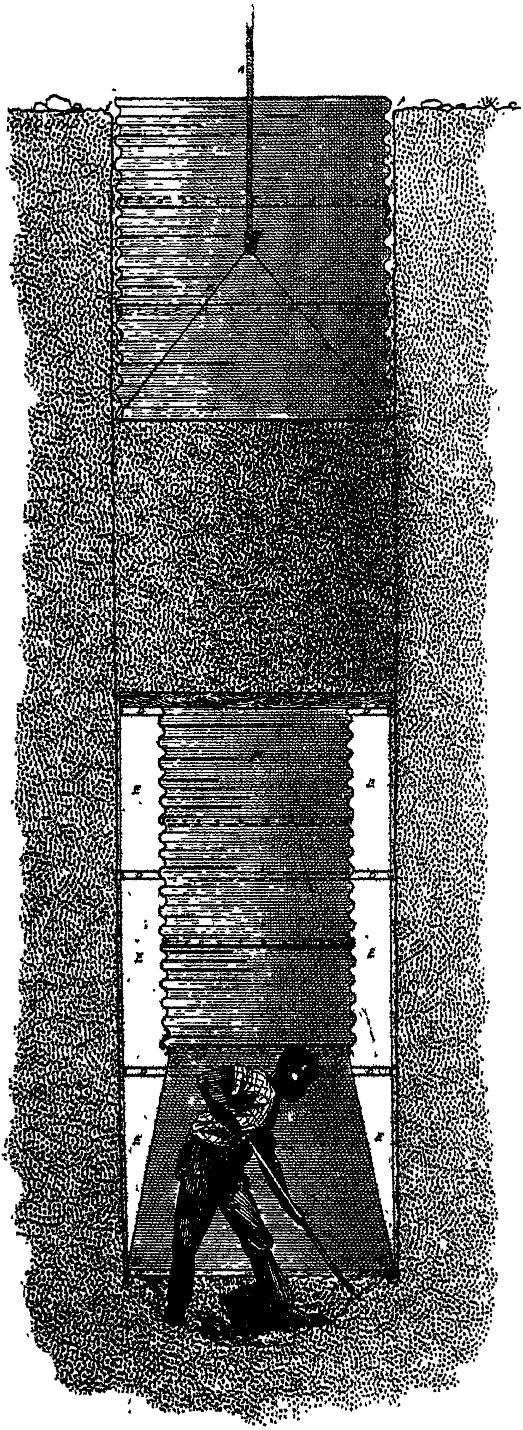
Spraying with an arsenical poison may be a help, for all the beetles that feed on the sprayed foliage will be destroyed. *Arsenate of Lead*, 1 lb. to 10 gals. water; or Paris Green 1 lb. to 160 gals. water, to which 2 to 3 lbs. of freshly slaked lime have been added, may be used to advantage. With the Arsenate of Lead there is no danger of burning the foliage. If the proper amount of lime is added and the mixture not allowed to stand there is little danger to foliage from Paris Green. But if the lime is of poor quality and the mixture allowed to stand for some hours—say overnight—there will very likely be slight injury from burning. Only shrubs and trees without fruit and plants, the leaves of which will not be used for food, should be sprayed with the poison solution. The effect of poison will not be apparent, for as soon as the beetles feel the effect, they have a tendency to hide away. So, even if thousands were destroyed, one might have to hunt a long time to find one dead one.

The great drawback to all of these methods is that the beetles keep coming out of the ground for some time, and, although thousands may be destroyed, there may seem to be about as many the next night. This is partly due to their coming in from different places. But if all the farmers in any one community would co-operate the results would be more satisfactory.—C. W. MALLY, Acting Government Entomologist.

Springs Alongside Rivers. (*Continued*).

"Apex" writes:—Farmers probably know far more about where to sink for springs and to get river soakage than the writer does, but if we have a common interest in this matter, perhaps we can help each other. These little waters showing in the river sand after a three or six months' drought, how are we to locate them so that we can sink a pit above a flood level and get them clear even when the river is running mountains high ? Get a water finder with his forked stick (or bent wire), some will say, and yet others who cannot understand the reason why the wand works, ridicule the idea, and despise this magnetism. One thing is certain, that the water finder's art, like meteorology in this country, is very little understood, and he can neither tell us the depth nor the quantity of the supply, but where we know there is water running into a river bed and we only want to locate it on its course, are his services valuelesss ? Surely not, granted the foregoing for argument's sake.

Then comes the well for a wind-mill pump and these springs will pay best with such, provided that the site is an exposed one. Five feet in diameter gives ample room. Where lining is necessary, a round one made like a tank of corrugated galvanised iron bolted together and each sheet numbered by the maker, (so that the well sinker can, by seeing that the numbers correspond, refit without trouble), takes less iron than a square one and requires no wood, and cannot be beaten as a casing extending from the surface nearly to the level. Eighteen gauge branded iron is being specially imported for this purpose ; the ordinary 24 gauge roofing iron being too thin to last in such positions.



A.—Rope to surface.

B.—Wires hooked into Cylinder.

C.—Sectional Elevation of Pit, showing corrugated lining in process of being bolted up and lowered.

D.—Iron Bands, 1 inch by ¼-inch.

E.—Concrete.

F.—Sectional Elevation of Caisson.

G.—This cone space to be filled with ground before the concrete is thrown in between the lining.

H.—Cutting edge of Caisson.

But before this is fitted, a different lining must be inserted; one suitable for sinking itself through the sand and gravel to bed rock. Say we make a cylinder of the same diameter, by standing ten-foot sheets of roofing iron on end and bolting them to four black iron rings one inch broad and a quarter of an inch thick and of four feet nine inches outside diameter; bored with holes for the galvanized verandah bolts, and screw these bands to the iron sheets through every other corrugation. Then to the bottom of this cylinder on the inside we must bolt some more sheets (not corrugated) to form an inverted funnel, the top of which must be four feet high and bolted to yet another corrugated cylinder three feet six inches in diameter and extending upwards for six feet. This when completed must be lowered in one piece and the ground filled in to the level of the top of the funnel; then concrete must be lowered and the space between the inside and the outside linings filled with it, then we have an engineer's "caisson" and all that remains to be done is to get inside it and undermine it working round and round in one direction under the cutting edge and its weight will sink it through sand and gravel.

The pump must, of course, be kept going where the water is strong, as a man cannot shovel out in much over two feet of liquid. When the caisson has been sunk to bed rock, then the corrugated lining can be put together on the surface suspended on a rope lowered as each few sheets are added. Concrete for this should be as follows viz.:—Eight buckets of stone size of walnuts. Clean coarse sand four buckets, and cement one bucket. The cement and sand to be mixed dry until they are all one colour and then wetted and afterwards spread over the stone and mixed thoroughly, care being taken not to lift the shovels from the mixing floor or the stones will roll away from the mortar. Lower quickly and ram lightly with a crowbar to make all solid, filling in four or six inch layers and working round in one direction.

Accumulation of Fine Sand in the Intestines of young Ducks and Chickens.

During the last three months (writes the Chief Veterinary Surgeon) we have examined the bodies of a considerable number of young ducks and young chickens, in which we found that the cause of death was acute enteritis due to an accumulation of fine sand in the intestines. In some cases we found the lumen of the intestines full of sand. Young ducks are specially liable to swallow a quantity of fine sand, when they are fed and watered on sandy soil; or have access to a stream or drain which runs along a sandy channel. One large brood of young ducks which I had under close observation, were healthy and thriving well until they were about five weeks old —when they were let out of their confined area and allowed to run in a large garden the soil of which was mainly sand. Within a week, they were observed to be less lively, and falling off in their appetite and condition. Their food was varied and improved in quality as far as experience could suggest, but no improvement became manifest. Ultimately two died, and the cause of death was at once shewn to be sand in the bowels. The brood was at once removed to a hard gravel yard the seedy looking ones were repeatedly dosed with small doses of olive oil, one died, and the others gradually recovered. But a more considerable proportion remained stunted, and never grew out as they should have done.

Warts on Poultry.

An esteemed correspondent sends an interesting communication on this subject. He says:—" When we met last, you will remember me saying that I found white precipitate ointment a good remedy for this disease. I have used it for several years, and I have lost very few turkeys when it has been used early. This year the usual outbreak occurred and the ointment was applied, but it did not produce the usual satisfactory results. It may have been too weak. At any rate, as I have close on 200 young turkeys, I decided to try a more drastic remedy. The result of experiment is that I find nothing better than the *Thermo-cautery* to stop the growth of these warts. I use a red-hot packing needle, and take care to get it well home. This arrests the growth of the wart at once; it shrivels up and hardens, and its edges lose the inflamed appearance, and in the course of a few days it becomes detached from the skin, and eventually comes away. I apply the white precipitate after the effect of the cautery is apparent, to hasten the removal of the wart.

"I am certain that hundreds of young turkeys about these parts,—Stellenbosch and Paarl—die each year from these warts. No doubt the growth itself is painful to the bird and checks its development, but I do not think that the birds ever die from the direct effect of warts, nor is their general health much affected. Death is due to the fact that the warts invariably spread to the eyes, closing them up, the chick in consequence does not feed, and dies of starvation. What is the cause of this disease? In my experience it appears almost entirely confined to turkeys. I rear hundreds of fowls and they intermix freely with the turkeys, but I have only had two affected with these warts, and they were adult birds.

"I have on several occasions seen the common turtledove affected with warts. I was able to catch them, owing to the warts having covered their eyes. Quite 80 per cent. of my young turkeys become more or less affected with these warts every season, and this is the average condition of the young turkeys reared in the district. The time of the year when the warts first appear is from about the end of September to the end of January. The warts begin to appear on the turkey chicks about the time of their first moult or a little earlier. The smallest birds up to about eight weeks old do not become affected, but from that age up to about the time that they have shot the red, put on adult plumage, and the fleshy spots show up on the head and neck, the warts appear. I have never seen an adult turkey with warts, nor even a brooding hen, although all her chickens may have been affected, which appears strange if warts are infectious.

"As the warts affect the turkey chicks at their most tender and delicate age, it may be that, under the debilitating influences connected with moulting and other changes referred to, they are more susceptible to the infective agent which produces these warts. At any rate, I purpose during the next breeding season to try, by every means that I can devise, to fortify the system of my young turkeys during the critical period, and see if I cannot rear them without warts. The growths appear as hard warts, and increase in size for some weeks if not treated. The parts affected are the head, almost any part from the beak to the top of the neck, and also the joint of the leg, and I have seen them between the toe joints. I may also mention that if the skin of a bird suffering from warts is scratched, the sore does not appear to heal nicely, but presents a rough crusty look and heals slowly. Still I have not seen a wart on the body of any birds."

On this the Chief Veterinary Surgeon offers the following:—With respect to warts, they are described as enlargements and prolongations of the papillæ of the skin, and a thickening and hardening of the epidermis which covers them. Warts are usually found on young animals only, including mankind. We have not had many cases of warts on young turkeys brought under our observation, but we have seen any number of fowl chickens affected. In these, the warts usually appear first about the head, but in many cases they come out all over the body, similar to an eruption. They are decidedly infectious to chickens, both by cohabitation and by inoculation. Older fowls do not appear to be susceptible. In many of the outbreaks which were brought to our notice, the warts were however associated with "Roup," the latter seriously complicating the case, and usually killing the patient. But when the chickens were affected with warts only, and treatment adopted in time, they usually recover. Warts spread very rapidly over the whole flock of chickens, and as in the young turkeys referred to by our correspondent, it affects them most about the time of their first moulting. Warts or papillomata are very frequently met with in great numbers on the mucous membrane of the mouth, lips, and fauces of young dogs. And on many farms, more particularly in the Eastern districts. warts on young calves, become an annual plague, causing the death of a considerable percentage of those affected.

I have seen some young cattle with their heads, necks and fore-quarters literally covered with these warts of various sizes; some singly, while others would occur in clusters, causing the animals to present a most unsightly appearance, while the numbers that are situated around the eyes and mouth make it difficult for the affected animals to either see or feed. But notwithstanding the immense numbers of these warts in such cases, it is marvellous how rapidly they will sometimes disappear without any treatment, when the young animals arrive at a certain age. These warts on calves, although manifestly contagious to other calves, and the infection is evidently capable of persisting on a farm for years, yet it does not appear to be capable of being readily communicated to any other class of young animals on the farm. This would appear to indicate that the infective material of warts is to some extent special and specific to each particular class of animals.

The principal points for consideration in connection with this subject appear to be:—Are warts on young animals, including poultry, due to some special infective agent, or is their appearance on these young animals, due solely to constitutional weakness brought about by some abnormal conditions under which the young animals are reared; such as defective nourishment or insanitary surroundings? Or is it necessary that both the infective agent and a debilitated condition of the system, more particularly of the skin of the young animal, should be present before warts can grow and spread? The fact that you can introduce the disease by bringing one or more chickens affected with warts into a clean run and placing them amongst healthy chickens would clearly indicate that infection is the chief factor in the spread of warts amongst chickens. Similar evidence can be brought forward to prove the infectiousness of warts in young dogs, calves and foals. I am of opinion, therefore, that our correspondent should not alone prepare to improve the conditions under which he rears his young Turkeys, but he should also try and devise some method of clearing his poultry run of the infective agent.

Treatment.—This should be preventive as well as curative. The affected chicks should be completely isolated from all healthy ones at once, and each wart carefully dressed. There are many curative remedies which are successfully used, and I have no objection to the use of the actual cautery as recommended by our correspondent, but it is a method of treatment which requires to be used with care and caution, and in cases in which the warts were numerous it would be very painful. For the warts on chickens Tincture of Iodine is a very clean, safe and effective remedy. Take a fine piece of round stick, similar to a pen-holder, fasten neatly round the point of it a fine piece of linen, pour a little of the tincture into a small cup, dip the point of the covered stick in it and apply the dressing carefully to each wart about every second day. The stick does not sputter and waste so much as a feather, and you are not liable to injure the healthy skin by the spilt tincture. A stronger and more active dressing is a solution of Ethylate of Soda, this tincture should be applied with a small glass rod every second day. Care must be exercised not to let the dressing get on to the healthy skin.

EXTRA-TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries.

By D. E. Hutchins, F.R. Met. Soc., Conservator of Forests,
Cape Town.

(Continued from page 32.)

PLANTATIONS OF HARDWOODS FOR SLEEPERS.

Since 1896, the failure of metal sleepers has rendered it necessary to import large quantities of wooden sleepers, mostly Jarrah, from abroad. The Cape Government Railways required in 1902 £100,000 worth of sleepers, yearly for the upkeep of its lines. In 1903 maintenance and new lines caused the importation of £303,137 worth of timber for Railway purposes :—

Sleepers	£196.737
Other timber .. ..,	106,400
Total	£303,137

The Transvaal and Orangia have a present mileage above half that of the Cape Government Railways. When the projected railways are completed the mileage will be equal to that of the Cape Railways, so that Transvaal railway sleepers for construction and maintenance represent a very large quantity of timber required during the next few years.

Natal Railway requirements are about half those of the Transvaal and O.R.C. Railways.

Rhodesian Railways make large demands for sleeper timbers, but this can probably be satisfied in great part from the local Rhodesian Teak forests on the Wankie line.

Mileage of South African Railways, 1904 :—

	Miles.
Cape Colony	2,751
Natal	707
Orange River Colony	505
Transvaal	1020
Rhodesia	1,671
Total	6,654

(Grant Dalton, Cape Soc. C.E. 12/1/05.)

It may be estimated that, at present prices, not less than £322,000, say one-third million pounds worth of sleepers will be required yearly for South African Railways.

The average price paid for sleeper timber is 2s. per cubic foot. The standard sleeper cubes 2½ cubic foot and costs 5s. If we assume 6d. per cubic foot as the cost of sawing and trucking sleepers from a timber plantation near the Railway, that leaves 1s. 6d. per cubic foot as the nett price of the sleeper timber in the plantation. This is a good price for timber standing in the forest, and it renders extremely favourable the financial position of the Railway Sleeper Plantations: for a simple calculation shows that *as soon as the average production of sleeper timber reaches the moderate figure of* 160 *cubic feet per acre per year, the yearly yield of timber equals in value the first cost of such plantations, since* 160 times 1s. 6d. equals £12, which is the total cost of planting and maintenance. As will be seen below, 160 cubic feet per acre per year is a very moderate yield for a Eucalypt plantation. Sample plots of Karri at Tokai have yielded up to 625 cubic feet per acre per year at 13 years of age. One quarter acre of *Eucalyptus saligna*, 18 years old, had an average yield of 527 cubic feet. Higher figures have been obtained in Natal and India. The mean yield for the *whole 60 acres* of Eucalypt plantation cut over for pit-props at Worcester in 1890-92 was 332 feet, taking the Railway weights of timber sent away, so that we may safely say that in well-placed sleeper plantations with the best growth the average yearly yield of timber, reckoning the value at present sleeper rates, varies between once and twice the original cost of making the plantations. This result is, of course, extremely favourable. It is rare that timber plantations can give so good a return. This favourable result is due (1) to the quick growth of timber in this climate and (2) to the high price paid for sleepers in South Africa.

To carry the calculation a step further, and allow for interest, let us suppose that this sleeper timber can be cut when 35 years old. In 35 years a sum of money at 4 per cent. compound interest quadruples itself. So that if a plantation is yielding at the moderate rate of 160 cubic feet per acre per year it repays the cost of planting *plus interest* every two years, since when cut at 35 years the timber has a mean age of 17½ years.

I have taken 4 per cent. in the above calculation to be on the safe side, but for many years the Cape Government has been borrowing at 3½ or even 3 per cent., and doubtless will do so again. At 3 per cent. the calculation is of course more favourable. Thus £1 at 3 per cent. becomes only £2 16s. 3d. in 35 years, instead of £4 when interest is reckoned at 4 per cent.

PRIVATE AND STATE FORESTRY.

The present position of State Forestry in Cape Colony may be summed up thus:—

Over half a million pounds sterling (£500,000) has been spent in

Indigenous Forest, Knysna.

(W B Baker)

Forestry and the planting of about 22,000 acres of timber plantations. These 22,000 acres of timber plantations are now producing over one-third of the timber imported. None of the large timber in the plantations is yet mature. To increase the plantations so as to produce all the timber now imported will cost about half a million more. The sooner this half a million is borrowed and put into Forestry, the sooner we shall stop the present waste of the country's resources. The question has got shelved because it is of direct personal interest to no one; but it is of far more importance to the country than other industries that give a prospect of direct personal gain. Thus if we compare Forestry with fruit growing. Mr. Merriman, in his speech to the Horticultural Delegates in May, 1898, estimated the total value of fruit produced in the Colony at £100,000. It would require but a fraction of the farms now devoted to fruit growing to produce all the timber now imported, and costing Cape Colony £500,000 yearly and South Africa as a whole about £1,500,000 yearly.

SOUTH AFRICAN IMPORTS.

> "It is a notable fact that South Africa imports more now from England than any other country except India, and, taken per head of the population, more than any other country in the world. In 1902 British exports to South Africa were valued at £25,690,611, to India £30,109,628, to the United States £23.725,971, to Germany £22,852,252, to Australia £19,560,502 and to France £15,713,516. South Africa then, with a population, white and coloured, say, of 4½ millions, purchased in 1902 to the extent of £5 14s. per head."
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> (Presidential Address, Section C., S.A.A.S., Cape Town, 1903.)

The balance of trade is increasingly against South Africa. Year by year the imports increase, while the exports do not rise in proportion. The problem is how to produce more in the country. Forestry, when it proposes to meet the South African importation of one and a half million pounds worth of timber supplies the answer; but it will be at once asked, "Why does not private enterprise meet this demand?" Is not this a case which will be met according to the well-known law of supply and demand? This, however, is not so. Political economists in all the Forest Schools of Europe tell us that Forestry forms the one notable exception to the law of supply and demand the reason being the length of time required to meet the demand for forest products. There is certain forest produce, such as coppice, firewood, wattle-bark, and pit-props, which can be produced in a few years, and can be supplied by private forestry. But when it comes to house-building timber, requiring 60 or 80 years to produce, it is easy to see why the law of supply and demand fails. A man does not care to plant trees for the benefit of his grandson, or embark on an enterprise which will not give him a return for one or two generations. The State, however, has no life and death, and the State forests are so large that they supply timber continuously. These, we shall see presently, are enormous advantages. The aims of State and private Forestry are different. The private forest owner, when he grows trees for profit, aims at the maximum interest on his invested capital, not at the maximum production of his land. This is well seen in the case of fruit trees. Quite naturally the private forest owner will rather have a small return for himself than a large return for his grandson. His fruit trees may yield a good interest on the capital they represent, but the land is producing less than it might.

The reasons which tell in favour of State Forestry may be summed up thus:—

(1) *Low rate of interest.* The State can borrow at 2 per cent. in England and 3 or 3½ per cent. in Cape Colony. The private owner must pay his 5 or 6 per cent., or perhaps more, when it is a question of a financial enterprise, that will give little return before the lapse of half a century. Now the difference between 3 per cent. and 5 per cent. is enormous. At 5 per cent., compound interest, a sum of money doubles itself every fifteen years; at 3 per cent. it doubles itself every 25 years. In 80 years £1 at 5 per cent. becomes £50, at 3 per cent. only £10·6. If a private forest owner borrows at 5 per cent. and plants an acre of forest at a cost of £12, he must get £600 an acre for his timber (at 80 years) before making any profit; but the State, planting at £12 per acre, and borrowing at 3 per cent., at the end of 80 years has sunk only £172·2, and it is a miserable timber plantation that does not yield more than £172·2 per acre at the end of 80 years! Or, put it another way: with timber at 6d. a cubic foot standing in the forest the private owner just comes out with an acrim (yield) of 300, while the State pays expenses with so low an acrim as 63·6. This calculation shows that the private owner can only hope, under the most favourable circumstances, to grow large timber at a profit, such as where he raises a pine plantation with *in situ* sowings at a cost of £3 per acre. While, on the other hand, the State can grow timber of large dimensions with a wide margin of profit.

(2) *Cost of management.* Small plantations and detached forests are always expensive to manage. Take the case of a timber plantation under 2,000 acres in extent. To keep the Manager or Forester fully employed, 2,000 acres would be planted in about five years; then for the rest of the time a staff, yielding no return, has to be maintained for the care, fire-protection, and police of the forest. If, however, the 2,000 acres form portion of a larger area, say 4,000 acres, the staff actually employed in the adjoining forest, by their mere presence, act as police and fire watchers, till the area first planted wants thinning and regular working. A good reliable staff always on the spot is the first essential for fire-protection.

(3) *Continuous supply.* A large forest under State ownership will afford a continuous supply of timber to forest industries. Villages spring up around the forest, supported on work in the forest, and on working up of the timber; but all this requires a steady continuous supply of timber and a large forest. Take the well-known case of the High Wycomb Beech Forest and the chair industry in England. A man who has a small plantation or timber forest may find himself with a crop without a market, or with a market so distant that the whole value of the timber is lost in the cost of working and transport.

Eucalyptus saligna and E. diversicolor at Tokai Sphinx Rock

(Fourcade.)

(4) *Permanent ownership.* State forests are the inalienable property of the State and the country; private forests are liable to be sold according to the necessities of the owner. A change of ownership is likely to be followed by a change of management, a rupture of the working plan, and loss. Thus, we may have a land-owner who is an enthusiastic lover of forests and trees. He dies, and leaves his estate to a spendthrift son. It is the fate of most men to be pressed for money at various periods of their lives. If they are forest owners, there is a constant temptation to realise the value of their timber, and perhaps put the money out at a higher rate of interest.

(5) *Climatic influence.* It is the slow-growing trees that have the surest and largest influence on the conservation of the water of the country. Of these there are notable instances in the indigenous forest of South Africa and in the Sholas of the Nilgiris, South India. Private enterprise can rarely be expected to plant slow-growing trees for the general well-being of the country.

The above only applies to timber proper. Firewood, wattles, and any forest produce which matures quickly, the private owner can produce as well as anything else. There are two notably successful cases of firewood and wattles being produced by private enterprise, viz., the Black-Wattle plantations of Natal and the Casuarina plantations of the Madras coast. Natal now produces Black Wattle (*Acacia decurrens*) bark and poles to the value of £100,000 yearly. One hears of private owners who draw a steady nett income of £4,000 a year with little trouble and none of the risks attending agricultural pursuits. When I was in Maritzburg last year (1903) the £10 shares of the Town Hill Wattle Company were quoted at over £100. These are excellent results; they are unique in the history of private Forestry. They are only possible in the more forcing climate of the extra-tropics. In Europe the private forest owner is satisfied with a return of 3 or 4 per cent. on his forest capital, and usually can only produce pit-props, firewood, or other short rotation stuff. The Natal Wattle planters at present have not only the value of their bark, for which there is a certain and extended market in Europe, but a good price for Black Wattle poles, which are now being extensively used in the Johannesburg mines. Labour is not costly in Natal, and the Wattle gives a return in from five to seven years. Without this it would have been impossible for the Natal Wattle planter to have achieved his present position and produce as much as £100,000 worth of forest produce yearly. Mr. Sim, the Conservator of Forests in Natal, estimated in 1902 that the total area of private timber plantations in Natal amounted to 30,000 acres, of which 25,000 was Black Wattle. The Natal Wattle industry is only 20 years old. In Wattle barks and pit-props the South African timber planter has chances which few private timber-planters possess. It is said that De Beer's Mining Company alone requires about 100,000 pit-props yearly.

After the Natal Wattle plantations, the most successful instance of private timber plantations is that of the Casuarina plantations, near the City of Madras. Here worthless sand coast dunes have been planted with *Casuarina equisetifolia* for the supply of firewood to the populous City of Madras. Considerable profits have been realised, but not so large as in the case of the Natal Wattle planters. See below under *Casuarina equisetifolia.*

These are the two most successful instances of the production of wood in private plantations, but there is no question here of the production of timber of large dimensions for house-building purposes, which is a national want in every civilised country.

It is true that on the Continent of Europe, house-building timber is produced to a considerable extent in private forests, but Forestry there is understood as it rarely is amongst Englishmen, and the forest owner is happy with a return yielding a much lower rate of interest than would satisfy an English Colonist.

The firewood copses of Western Europe are another instance of successful private plantations worked at short rotations. These have been maintained for many years, but are now yielding decreasing profits owing to competition from coal.

The plantations of Cluster-pine in Gascony are largely in private hands. Here the yield of resin gives the private owner that profit which he could not obtain if he had to wait for the maturity of the timber.

Japan is the only country out of Europe where private plantations for the production of house-building timber have been made on a large scale. Here we have the advantages of cheap and abundant labour, together with a very fertile extra-tropical climate, able to produce coniferous timber under the most favourable conditions; and also, it must be confessed, a keen-witted,and active people, far-seeing enough to get the most out of their land. They contrast curiously with some others, the thriftless Spaniards, for instance, who have half ruined their country by forest destruction. In this respect Japanese Forestry is ahead of that of all nations. We cannot in the less fertile climate of South Africa expect to equal the Japs, and we may well in South Africa look on the production of house-building timber as the exclusive function of the State. Indeed modern Japan is now providing for the State production of large timber.

HISTORICAL.

It is the first duty of an Englishman abroad to try and avoid looking at Forestry through British spectacles; to see Forestry and to value it, as it is seen and valued on the Continent of Europe: and, let me add, as it is seen and valued by those shrewd imitators of all that is best in Europe, the Japanese.

Let us glance at the history of Forestry. The Japanese are the oldest Foresters. The Japanese are the first people who tended and planted forests. The Japanese had carefully preserved and cultivated forests above 1,000 years ago. Natural reproduction and planting are easy in the fertile climate of Japan, and clean cutting is the common system there They have invented a peculiar system of seasoning timber in brackish water (described below). The origin of many of their fine forests is lost in antiquity. They date back beyond the historical period. They have always, as far as known been carefully cultivated, and kept at the maximum of production. At the International Forest Exhibition, held at Edinburgh in 1884, their exhibit surpassed that of all countries, and was the admiration of all the European Foresters who saw it.

In Europe, the Greeks and the Romans, says Roth, "had some notion of the value of their forests, and put forth many efforts to prevent their useless destruction. These efforts were of little avail, and the Mediterranean lands to-day are sorely in need of more wood, and their mountains of a better cover." The Romans have left descriptions of various European forests, but they had no conception of the tended and cultivated forest of modern times.

Then came the dark ages, but as soon as the Church and the various European States became organized we begin to hear of Church Forests, Royal Forests and Communal forests the latter owned by towns and village. The Kings, and the Princes of the Church loved their forests for the game it contained and the revenues drawn from the timber and firewood. The Monastic Institutions had their carp ponds for Friday's dinner, the forest supplied the choicest meat for the other six days of the week and fuel for every day of the week! The peasants cut firewood and worked in the forest by way of rent for the Church Lands they lived on. At first these were of little importance. They were often ill-defined and consisted only of areas, in the great wild unowned forest, over which certain rights were exercised. Many of the finest forests I have ever seen in Europe were planted and tended by the monks. One of the best known of these is the glorious forest of Valambrosa near Florence. The old monks were good Foresters. Their cultured leisurely lives gave them time and opportunity to study the forest in which so many of them lived secluded. Like so much else, to the monks we owe the beginnings of Forestry in Europe. When the Church lands were confiscated at the time of the French revolution, or later, as in Italy, it was from the Church forests that most of the national forests of our day were derived.

Communal forests arose with the growth of the towns and villages. As population increased and clearing for cultivation extended, the towns and villages saw their supplies of firewood threatened, and acquired forests of their own. Roth says that in Central Europe as early as the thirteenth century the clearing of forest was regulated and in many localities entirely forbidden.

Royal and Church Forests becoming National Forests.

The royal forests were always strictly conserved and carefully tended on the Continent of Europe till the time of the French Revolution, when with the general overthrow of despotic monarchs most of the Royal forests became National forests and were administered by the Government Forest Departments. The King of Portugual could not take his Royal Forests to Brazil with him and when he came back, the national forest remained national forest. Spain was in similar case. Considerable areas, especially in France, were sold during the troublous times of this period; but as soon as the power of the people settled into established government the value of the forests was seen; and since then they have been carefully preserved and scientifically managed, though often, as in Belgium, there was considerable delay before Forestry came to be recognised as a national work of the first importance. Belgium has made great strides in Forestry but mostly within the last 12 or 15 years. Forty years ago systematic Forestry had hardly begun in India; there is now a nett revenue of a million pounds sterling.

Historical sketch of the growth of Forestry on the Continent of Europe.

From the seventh century onward, says Dr. Schwappach speaking of Germany and Central Europe, the great ecclesiastic and civil magnates gradually asserted their power, and during the course of the next few hundred years they possessed themselves not only of the previously unclaimed land, but also of the larger part of the national forests. Similarly they appropriated, almost everywhere, the forests belonging to the original free settlements, but this they did without restricting the use the peasants made of them. In order to get the value out of their extensive possessions, the owners of the land carried on schemes of settlements, in which each community was, as a rule, assigned a part of the forest for common use.

About the year 1,000 A.D. we find the forest divided as follows:—

(*a*) The private property of the sovereign, or of ecclesiastical and civil authorities.

(*b*) Communal woods belonging to the original free settlers or to communities subordinate to the lord of the manor.

Smaller woods, privately owned, were at that time quite the exception.

Conversion of the forest into arable land was a common practice far into the latter Middle Ages. The particularly rapid growth of the population during the eleventh and twelfth centuries gave rise to a period of active forest destruction. Favouring this was the improvement in agricultural methods, which gradually spread from west to east.

Before the end of the Middle Ages it became apparent that the destruction of the forests was endangering the timber supply of the towns and trades dependent on the forest for their raw material. Not unimportant also, as an incentive for legislation, was the necessity of forests for the purposes of the chase. Prohibition limiting further clearances were brought about, first in the more settled and, for those early times, comparatively densely populated parts of Germany.

In the Rheingau, restrictions were made in 1226, and many enactments in the fourteenth and fifteenth centuries laid down laws and prescriptions for the regulation of the fellings. These ordinances were welcomed alike by individual land owners and village communities. Their object was to introduce methodical treatment in place of previous haphazard utilisation of forest products, and to ensure the permanence of the supply.

Even thus early, we find such subjects dealt with as estimates of the actual requirements for timber and fuel, extent of existing woods, supervision of work done in the forest, regulation of grazing cattle, and similar matters.

At the same time, rules were formulated prescribing the means whereby exhausted forest might be reproduced. The oldest method of regeneration was the protection of young growth which had arisen spontaneously. This led very naturally to the preservation of seed trees, whose function was to sow the ground, and any persons destroying trees left for this purpose were severely punished.

The earliest effort to control utilisation so that uniformity of forest yield might result, was made in the year 1350, at Erfurt, in Germany. The forest was divided into parts, one of which was annually cut over in rotation. Coppice shoots restocked the area by natural means, and the fellings were so planned that a sustained yield was rendered possible.

The first mention of the formation of pine woods by direct sowings occurs ten years later in connection with the town forest of Nuremberg. During the fifteenth century this practice became general throughout South-western Germany.

In the course of the sixteenth century various improvements on the former crude sylvicultural methods suggested themselves. Amongst these may be mentioned the sytematic arrangement of the felling areas, the removal in the thinnings not of the best but of the inferior classes of trees, the selection of good trees to produce seed, and the fostering of such natural growth as was already present.

The devastation of the Thirty Years' War not only put a stop to all progress, but brought about a return of the old misuse of the forest, and this continued till the end of the seventeenth century. When consideration was again given to sylviculture, the initiative was taken in the north-west of Germany, more particularly in the Harz Mountains. Most of the credit for the revival of sound principles is due to the labours and energy of Von Langen. The natural regeneration of coniferous woods had long been rendered difficult by damage wrought in them by storms. Von Langen devised a scheme whereby the woods were sheltered in their most critical period by means of cutting series.

Before the commencement of the eighteenth century forests of broad-leaved trees were managed as Coppice or Coppice-under-standards. But as timber of larger size came more into request, the length of the rotation was extended. Then came the question of regeneration, high forest being generally raised, not from stool shoots, but from seed.

Naturally regeneration by seed from trees seems to have been almost entirely neglected up to this time. The formation of woods by means of the natural fall of seed had long been practised with

Conifers, but was only now successfully attempted with broad-leaved trees, more especially with the Beech. This problem was first satisfactorily solved in Hesse about the year 1730, by giving special attention to the requirements of the young plants for shelter. In 1736 the forest ordinance of Hanau-Munzenburg—a decree regulating the management of the forests there—prescribed that special attention be paid to the interests of the new rather than merely to the utilisation of the old crop. The felling was divided into three stages—a felling for seed, a felling for light, and a final felling. In 1764 an advance or preparatory stage in the felling was made to precede, by a few years, the cutting for the production of seed.

Towards the close of the eighteenth century the planting of Spruce was tried, though with little success; but at the beginning of the next century direct sowing of Spruce seed was followed by much better results, and this method came rapidly into general use both in North Germany and in Thuringia.

The demand for timber continuing to increase, it became compulsory, or at least highly desirable, to institute definite plans for the regulation of the yearly fellings.

Until woods which had been recently formed became of serviceable size, the older forest was the only source of supply, and the object of these early working plans was so to allocate the annual fellings that the old forest would not be exhausted before the younger woods were available. ("Forestry," by Dr. A. Schwappach. —Translated by Fraser Story and Dr. Eric Nobbs).

Systematic State forestry may be said to have begun in the small German States over 300 years ago. Ordonnance du Comte de Mansfelde, 1585 (M. Parade.)

The communal forests of Germany, France, Switzerland, &c., had a fate different from that of the common lands in England. Instead of cheap coal and the dirty, smoky atmosphere of English towns, there was pure air and wood fuel; and the forests that supplied the fuel so essential in these colder countries were jealously guarded. One of the show forests of Europe now is the Sihlwald. This has belonged to the city of Zurich for 1,000 years, and for 600 years has had the fellings carefully regulated by calculation.

At present in Germany two-sixths of the forests are owned by Government, three-sixths by private owners and one-sixth belongs to towns and villages.

FORESTRY IN ENGLAND.

According to Dr. Schwappach, the indigenous timber trees of Britain are limited to the following:—

Leafwoods—Oak, Ash, Beech, Wych Elm, Birch, Aspen, Hazel and Alder.

Conifers—Scotch-pine and Yew.

This paucity of Conifers is remarkable if we compare Britain with similar countries, Japan, for instance. It is explainable, doubtless, by the same geological changes that have rendered Scotch-pine and Yew almost the only indigenous low land Conifers of North-western Europe.

The forests of England have played an important part in its history. Its damp, mild climate is naturally fitted to the growth of the finest forest, and when the Romans landed, the greater part of Britain was covered with forest. Their settlements caused large clearances, but they left dense masses of forest unpenetrated : this we see in the deviation of certain of their straight roads. When they departed, the forest in that favourable climate would naturally regain possession of much of the Roman clearings, and in the time of the Saxons we find the forest dividing and splitting up their kingdoms. "Thus," says A. L. Smith, "the West Saxons found their natural boundaries determined by Andred's Weald on the east, by Selwood on the west, as decisively as by the Thames and the sea on the north and on the south. Kentish folk, East Saxons and East Angles were cut off from each other by marsh and wood ; so were Mid-Angles from West Angles, Deirans from Bernicians ; while along the Severn, in the Peak district, and in the hills of the kingdom of Elmet, the nature of the ground long barred the way westward, and from the Clyde to the Parret, the Welsh in their forests confronted the invaders in a long continuous line until the seventh century. The mighty Andred's Weald, even in Bede's day, lay stretched for 120 miles from Hampshire to the Medway. The Wire Wood covered what are now Worcestershire, Shropshire and Staffordshire, as Arden once covered Warwickshire. Epping Forest was part of a greater whole, which extended from London nearly to the Wash, as another such region from the Peak to the Trent; from the Peak to the Tees was little but desert; from Tees to Tyne was one great forest in St. Cuthbert's days. These great woods were rapidly cleared or opened out, when the Norman kings came." (A. L. Smith, M.A. Oxon. in "Dict. of Eng. Hist.") At the same time the Norman Kings introduced strong forest laws for the protection of the royal forests. They were devoted to the pleasures of the chase. Says the Saxon Chronicler of William the Conqueror: "He loved the Great Game as if he had been their father." When the Norman Kings gave forest to the monasteries they reserved the royal hunting rights.

The ancient forest laws of England defined a forest as containing eight things, that is to say, soil, convert, laws, courts, judges, officers, game and bounds. The forest's produce was defined as vert and venison, vert being the trees and minor forest products, while venison included all game. The forest laws of the Normans, as other laws of that period, were cruel. To hunt ordinary game was severely punished, to hunt a royal stag rendered the offender liable to the loss of his eyes, and when a dead stag was found killed by poachers a solemn inquest was held on the body as if it had been a human being. But this was not all. The forest in Norman times was not the mere game preserve to which it has degenerated in modern times in England ; vert, *i.e.*, timber and minor forest produce was as jealously protected as was game under the Norman forest laws.

There were special forest courts to carry out these laws. The "Wood-mote" or lowest court met every forty days. In this court the Foresters made their reports to the Verderers who originally were a special jury of forest assessors. From this court important cases were referred to the "Swain-mote," which met thrice a year, and final judgment was given by travelling Forest Justices. The Norman kings who succeeded William the Conqueror, however weak in many matters, held fast to the forests and forest laws, though these were maintained at the expense of much unpopularity with the people on which the throne was dependent in its struggles with the Norman nobles. The love of the Norman kings for the forest was not due entirely to the pleasures of the chase, devoted as they were to these. William the Conqueror lost two sons hunting in in the New Forest. But in addition to the pleasures of the chase the Norman kings derived from the forest the advantages of the forest revenue and of a small standing army represented by the Foresters and Game Keepers: and later Charles I., when he was unable to get money from Parliament, drew largely on the royal forests, selling some and arbitrarily enlarging others so as to increase the forest dues. He got £20,000 as his share of the alienation of the Waltham (Epping) forest.

The English forests were at their zenith in the reign of John, whole counties being at that time subject to the royal forest rights—vert and venison. Magna Charta curtailed these. Edward I. made large forest concessions, but in the' time of the Tudors royal forest rights still existed in twenty counties.

In the fifteenth century quaint old Harrison wrote thus regarding the diminishing woodlands of England:—

"Howbeit this much I dare affirme, that if woods go so far to decaie in the next hundred yeere of Grace, as they haue doone and are like to do in this, * * * it is to be feared that the fennie, bote, broome, turfe, gall, heath, firze, brakes, whinnes, ling, dies, hassacks, flags, straw, sedge, reed, rush, and also seacole, will be good merchandise euen in the citie of London, whereunto some of them euen now haue gotten readie passage, and taken up their innes in the greatest merchants' parlours. * * * I would wish that I might liue (live) no longer than to see foure things in this land reformed, that is: the want of discipline in the church: the couetous (covetous) dealing of most of our merchants in the preferment of the commodities of other countries, and hinderance of their owne; the holding of faires, and markets upon the sundaie to be abolished, and referred to the wednesdaies: and that euerie (every) man, in whatsoeuer part of the champaigne soile enoieth (that enjoyeth) fortie acres of land, and upwards, either by free-deed, copie-hold, or free-farme, might plant one acre of wood, or sowe the same with oke mast, hasell, beech, and sufficient prouision (provision) made that it may be cherished and kept. But I feare me that I should then liue (live) too long, and so long, that I should either be wearie of the world, or the world of me." ("Of Woods and Marshes," by Harrison.)

In 1563 Bernard Palisey wrote in the same strain :—

"When I consider the value of the last clump of trees, or even of thorns, I much marvel at the great ignorance of men, who, as it seemeth, do nowadays study only to break down, fell, and waste the fair forests which their forefathers did guard so choicely. I would think no evil of them for cutting down the woods, did they but eplant again some part of them: but they care nought for the time to come, neither reck they of the great damage they do to their children which shall come after them."
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Harrison's "sea cole," however had come to stay. In vain did the King of England prohibit in 1306 under a penalty the use of coal in London. Dick Whittington and the London merchants made money by importing coal from the North, and the king's proclamation soon became a dead letter: while the small wood of the forest, which in many parts of Europe was worth more than the timber, was put out of the English market by coal. London fogs started when London had a population little more than the present white population of Woodstock Cape Colony), *i.e.*, under 35,000.

In 1641 the Commonwealth (like the French revolutionaries 160 years afterwards), recommended the sale of the English royal forests, and though some were sold, many were redeemed at the Restoration. As late as the eighteenth century the English royal forests were still reckoned at sixty-eight in number, but they were in a terribly neglected state,—encroached upon on every side and their administration corrupt to the core. The Dutch monarch, William III., with his knowledge of better forestry in France and Germany, effected temporary reforms. At the end of the eighteenth century the forests were managed by an official termed "the Surveyor-General," assisted by a staff of "Surveyors" and "Verderers." About 1809 reforms were attempted, and twelve of the twenty royal forests then remaining were re-enclosed and re-planted, and it was thought to reform abuses by vesting the management in Forest Commissioners, one of whom was a member of each ministry; but even this device did not procure a pure administration. At the end of forty years revelations of the grossest mismanagement were disclosed. There were reforms, but the management remained as regards scientific forestry entirely futile, and conducted solely from a revenue point of view. Many forests were sold outright, such as Sherwood Forest, to the Duke of Grafton. The office of Woods and Forests was separated from the Department of Public Works in 1851. By 1881 the revenue from the Crown Lands had risen to £390,000, a sum which more than covered the whole civil list. The revenues to-day are considered quite satisfactory, and little heed is given to the fact that £27,000,000 are being paid yearly to the foreigner for the timber, of which nine centuries of neglect has robbed the ancient forests of England.

With the destruction of the forest and the substitution of coal for wood fuel, English cities have gradually assumed their present grimy appearance. In 1902 Rolo Russell estimated the loss from London fogs at £5,000,000 (five millions) yearly. It is coal smoke that gives London fogs their worst features.

A few words may be added regarding the only two English forests of any size now left, viz., the New Forest and the Forest of Dean.

THE NEW FOREST.

The magnificent stretch of forest since termed the "New Forest" was called Ytene in Saxon times. It was a renowned forest even then, but its fertility and accessibility had led to its being destroyed in many places.

When the genius of William, the strong son of the peasant woman, introduced strong Government over England, the "New Forest" in Hampshire was demarcated and settled. This great work necessarily involved the eviction of the squatters who were destroying the forest, with their 108 poor settlements and hamlets. But with the forest destroyers, 22 little churches (36 says another account) had to go, and the destruction of the sacred edifices brought down on the great King the wrath of the monkish chroniclers, who enlarge on the sufferings of the squatters and say nothing of the noble estate which but for the unfortunate trend of English history would to-day have been the glory of the South of England. Beaulieu Abbey was not founded till much later [in King John's time] and there is no evidence that the great King in freeing this noble forest from the destroyers was unnecessarily severe on them. Then followed the long course of neglect and corruption sketched above.

The commission of 1853 put an end to the gross corruption that pervaded the forest administration, but it took no steps towards introducing a scientific management and it had the fatal consequence of giving the crown the power of alienation. The forest is now in a ruinous condition with the chance of improvement barred by the forest rights which still remain unredeemed; and the management is jealously watched by an influential local association which has for its object not the restoration of the forest but its preservation as a picturesque ruin and unproductive waste.

I have calculated that if England were to restore its ancient forests and produce at home the timber now brought from abroad at a yearly cost of 27 millions, there would be required a forest area equal to about one and a half "New Forests" to each county.

FOREST OF DEAN.

This forest (11,000 acres) is much smaller than the New Forest, 64,000 acres but being free from the servitudes which have ruined the New Forest, it is capable of rational management. The great Lord Nelson made a tour through the Forest of Dean which then was cultivated with oak for the Navy, and which he described as containing 23,000 acres of the finest land in the Kingdom. His report described the state of the forest as deplorable. Mature trees remained unfelled and natural reproduction was prevented by vast droves of hogs and flocks of sheep. Some deer still remained and these finished the few trees that were able to escape the pigs and sheep. There was the most shameful neglect, trees being cut down and left to rot, and fine oaks maliciously killed in order that they might afterwards be removed free as dead trees.

Then in a virtuous fit the replanting of Oak was undertaken: but it was done in defiance of one of the first rules of European Forestry, viz., it was planted pure. This was followed by even more unscientific thinning. Ten years ago the Dean forest was at its worst. Then, at last, an Indian Forest Officer on leave, was employed to formulate a rational "Working Plan" and the Forest of Dean is now in process of gradual restoration.

EPPING FOREST.

An expensive litigation lasting 15 years restored to the public the remains of the Epping and Hainault forest near London, which now comprise an area of 5,500 acres.

The present peculiar position of Forestry in England (and too often amongst Englishmen abroad) is due historically to two causes (1) the cheapness of coal rendering the cultivation and maintenance of forest unprofitable (2) the confiscation of the Church Lands in the time of Henry VIII., at a period when the national sentiment and the power of the people had not yet arisen. In Henry the Eighth's time, the confiscated Church Forests went, not to the people but to the nobles to whom at that time most of the power belonged. The Church Forests became private forests and as such shared the fate of most private forests viz. deterioration and general extinction. Both in Europe and Japan it has been found, on the extinction of the feudal system, that state ownership is necessary for the certain and continued preservation of the forests. On the continent of Europe there are certain exceptions to this rule, notably amongst the princely forest owners of Austria. But in Germany there is a strong public feeling against forest destruction which does not exist in England. Even in Germany the private forest is rarely equal to the State Forest. National Forestry is the natural sequence of the Royal, the Church, and the Communal Forests of feudal times.

Much as we may deplore the absence, of National Forestry in England, the case for National Forestry in England is nothing like so strong as the case for National Forestry in South Africa. England is a maritime nation with great surplus natural forests within a few days sail of its ports, in Sweden, Finland and Canada: while the forest to which South Africa looks for the bulk of its supplies is 6,000 or 7,000 miles away. And the climatic necessity for forests is much stronger in South Africa than in England where indeed it scarcely exists.

SMALL FOWL YARDS.

By F. Arnold, Pretoria.

This is an account of a small fowl yard, 1½ miles from Pretoria, for the twelve months January 4th, 1904,—January 5th 1905. No attempt is made to prove or disprove any theories of fowl-keeping.

Common Boer hens were originally purchased; some of these showed a marked strain of White Leghorn; others were of very mixed breed. The cocks purchased were fair specimens of White Leghorn breed, excepting one, which was a Plymouth Rock. All the birds were born in the Transvaal.

Except at night the fowls were not shut up; they had a large area (some 9 morgen) of land to run over. The fowl houses had one side open so that, although the birds were protected from wet, they were not "kept warm" at night. Early in the morning, before sunrise, they were let out of their houses.

Food was given them twice a day; in the early morning Kaffir corn, and in the afternoon crushed yellow mealies; occasionally a feed of mealie pap and cayenne pepper was given, especially on cold wet days.

During the last six months crushed mealies only were given.

Considerable attention has recently been paid in the Transvaal to the use of mealies for fowls, and there seem to be many opinions on the matter. Some people hold that mealies should never be given, others that they may be given if the fowls have large runs, and others again contend that the mealies should be cooked, or at any rate soaked in water. It is asserted that mealies cause fowls to become egg-bound and to die from fatty liver. None of these hens died egg-bound; two hens died from fatty liver, one of them had been suffering for a long time previously from a swollen foot.

It should be noted that many young cocks were for several months shut up in a small run about 20 feet by 8 feet and fed exclusively on mealies; none died. All hens when sitting were fed exclusively on mealies; none died, and only one deserted the nest, apparently sick; she recovered in two or three days; all these birds were shut up in small coops about 3 feet by 2 feet.

Fowls certainly get "liverish;" they will be seen in the early morning lagging behind on the perches instead of getting down to feed; all such birds were caught and given podophyllin pills; in a day or two they had recovered.

Mealies are said to cause diarrhœa. Only three hens suffered from severe watery diarrhœa; each was given ¼ grain of opium, some cayenne pepper, and some whisky (nearly neat); all recovered.

Roup broke out three or four times; no full grown fowls died, but chicks died wholesale. Chicks also were killed by hawks, cats, dogs, and probably small boys passing by. During heavy sweeping rainstorms many chicks were drowned or caught fatal colds. Two chicks became "crop-bound;" the crops were emptied, but death resulted. Young chicks were fed chiefly on coarse oatmeal and antheap.

Appended are tables shewing the number of eggs laid, expenditure incurred, &c., &c.

It will be seen that originally forty birds were purchased and that there were 189 at the end of the year. During the year there were available for the table 209 dozen eggs and 32 cocks.

The great blot on the year's record is the high death rate among the chicks; before a brood reached maturity a half or sometimes two-thirds of the original number died or disappeared.

TABLE I.

Purchased in January :—	
14 full grown hens	14
12 young hens	12
2 full grown cocks	2
Purchased in April :—	
1 full grown hen	1
Purchased in July :—	
6 full grown hens	6
3 full grown cocks	3
2 young cocks	2
Total number of Birds	40
Disposed of :—	
32 cocks	32
Stolen :—	
4 full grown hens	4
4 Young hens	4
Died :—	
1 full grown cock	1
3 full grown hens	3
135 young chicks	135
Total Number of Birds	179
On hand January 5th, 1905.	
Full grown hens	50
Young hens	28
Full grown cocks	4
Young cocks	16
Chicks less than four months old	40
Chicks less than one month old	51
Total number of Birds	189

TABLE II.

Hatchings :—

35 broody hens were given eggs varying in number from 6—15 apiece.

Number of eggs placed under hens ..	416
Number of eggs broken during sitting ...	24
Number of eggs to be Accounted for ...	392
Number of eggs hatched out successfully ...	328

83·67 per cent. of the eggs proved fertile, or roughly, 10 out of every 12.

Of these 328 chicks 135 died or disappeared within two months of birth.

TABLE III.

Number of eggs obtained :—

January (5th to 31)	59
February	49
March	97
April	117
May	174
June	190
July	247
August	387
September	369
October	383
November	408
December	402
January (1st to 4th)	51
Total for Twelve Months	933

416 eggs were used for Breeding purposes. 2,517 eggs were available for disposal.

TABLE IV.

Expenditure, etc.

January 5th, 1904 to January 4th. 1905.

Dr.	£	s.	d.	£	s.	d.	Cr.	£	s.	d.	£	s.	d.
To purchase of 40 fowls at 4s. each ..	8	0	0				By 209 dozen eggs value 2s. per doz...	20	18	0			
To purchase of Mealies, Kaffir Corn Mealie Meal, Oatmeal, Pepper and Medicines ..	16	13	0				By 32 cocks consumed, value 2s. 6d. each	1	0	0			
				24	13	0					24	18	0
To Balance (Profit) ..				25	8	0	By stock on hand value 98 fowls at 4s. each	19	12	0			
							40 young fowls at 1s. 6d. each ..	3	0	0			
							51 young chickens at 1s. each..	2	11	0			
											25	3	0
Total				50	1	0	Total				50	1	0

From this last Table it will be seen that a considerable profit, over 100 per cent., was made, although in drawing up this balance sheet the values given for eggs and "cocks consumed" are very moderate for Pretoria. It should be noted that this fowlyard was not farmed for profit but for a domestic supply of eggs and birds.

IRRIGATION IN THE NORTH-WEST.

Report of the Director of Irrigation on his tour of Inspection.

Mr. W. B. Gordon, Director of Irrigation has submitted the following report to the Commissioner of Public Works:—

THE BRAK RIVER.

1. Leaving Cape Town on 26th May, in company with Mr. Litchfield, of the P.W.D., I travelled by train to Britstown, and thence by road to Prieska, inspecting *en route* portions of the Brak River and its adjoining valleys. The contour surveys of the tract near Houwater which have been made recently by the Smartt Syndicate were a valuable aid to my inspection. They show that some 5,000 acres of a large flat, known as Tigerpoort Vlei, can be brought under flood irrigation by means of a short canal taking off from the left bank of the river; and that by means of another canal, some twelve miles in length, taking off on the right bank, the water of the river could be diverted into the Houwater dam, a large storage reservoir which was constructed some years ago by the Syndicate on a tributary of the river. The right bank canal would, however, be a costly work, and until a detailed estimate of its cost has been prepared I can make no final recommendation regarding it. But I have no doubt that the works required for the flood irrigation of Tigerpoort Vlei, on the left bank, will more than repay their cost. This Vlei. with its fertile alluvial soil and small surface slope, is an ideal place for flood irrigation, and long ere this it would no doubt have been brought under irrigation were it not for the difficulty of dealing with the Brak River.

2. Fifty or sixty years ago—within the memory of men still living—there was no Brak River. The country was then thickly clothed with grass and bush, there were few sheep tracks and fewer roads, and no bare patches of burnt veld on the mountain slopes. Under these conditions only a mere fractional portion of the rainfall can have resulted in surface flow, and even this must have met with many obstructions on the way, to check its velocity and prevent the

accumulation of any large body of water. Where the river now is, there was then, I am told, a series of reed-bordered pools, from one to another of which the water found its way by spreading over the intervening flats. In this way the low-lying lands along the course of the river were thoroughly saturated by every flood: they were covered with thick grass and bush, and even in years of drought they are said to have afforded valuable grazing for cattle, and an ample supply of drinking water. To-day, the river channel through Tigerpoort Vlei has a mean width of nearly 200 feet and a depth of 15 feet, and it is only a very extraordinary flood like that of September, 1901, which tops the banks of the river and spreads over the valley lands. Such floods are of short duration, and with a deep channel affording a free outfall for her drainage, the soil and the sub-soil soon lose their moisture. Thus, in the present condition of the vlei, one bad drought withers up the grass and causes serious injury to the bush. At the same time, in all probability, more water actually passes down the valley in the course of the year than was the case in former days; and where, as in the case of Tigerpoort Vlei, the slope of the country is sufficiently flat, there should be no great difficulty in bringing the lands back to something approaching their original condition as pasture lands, or even in bringing a large portion of them under the plough, where the soil is sufficiently deep and retentive of moisture.

3. But with a river of the dimensions which the Brak River has now attained, carrying in a high flood over 40,000 cubic feet per second, an ordinary loose stone, or stone and wire, weir will not suffice. The water can only be diverted by damming it and turning it over a long low ridge of rock, or, where this is not possible or is too costly, by constructing a substantial weir with well-protected flanks. Cheap and temporary expedients have been tried in this reach of the Brak River and have invariably failed, A sound substantial weir will be more economical in the end, even if it costs a pound for every acre to be brought under irrigation.

4. Between Houwater and the point at which the road to Prieska diverges from the river I saw no vlei of sufficient extent to justify the construction of a weir for its irrigation, but I understand that there are other suitable places higher up the river, and also on the Little Brak River.

5. Here, as elsewhere in the Colony, I have found considerable difficulty in obtaining definite information relating to the flow in the river. But from careful enquiries I have learned that although in 1902—3 the Brak River came down only once or twice and then continued to flow for a very short time, it has during the present year, or rather since last November, been in flow at least five times. Early in November and once again before Christmas it ran 1½ feet deep for two or three days. In January it was impassable for three days, and continued in flow for 19 or 30 days. Between January and March it came down on two occasions, on the last of which it carried a good supply for about a week. The local rainfall of Britstown during the same

period was less than half the normal, and the result is only too evident on Tigerpoort Vlei, where there is hardly a blade of grass, and in the Houwater dam, in which there is practically not a drop of water. Had means—such as have long been in contemplation—been available for utilising the waters of the Brak River, they would have gone far to counteract this deficiency of the local rainfall during the past year. The river will fail in a very exceptional year like 1903, but even then with some of the land previously irrigated, the stock will be in a better condition to face the drought, there will be a stored supply of forage, and on the first cessation of the drought there will be a quicker recovery, and a recovery while prices are still high.

6. I have now had a gauge erected in the Brak River near Kaffirs Poort, and made arrangements to have it read while the river is in flow.

7. One more point relating to the altered condition of the Brak River should be noticed. Now that the river has formed for itself a deep and defined channel, and thereby afforded an outfall for drainage, the subsoil waters from the adjoining lands slowly ooze into the river and are evaporated. The alkaline salts which they contain are left as a white efflorescence covering the bed of the river in many places, and extending up its sides to a height of 2 or 3 feet. This deposit is dissolved and carried away by the next succeeding flood. So brackish indeed is the water for the first hour or two of a flood that it is quite unfit for use on the land. Every flood, therefore, now carries away a considerable quantity of salts, and sooner or later this process must effect a change in the character of the soil and vegetation in the immediate neighbourhood of the river.

THE ORANGE RIVER.

8. *Prieska.*—At Prieska the Orange River was said to be exceptionally low for the time of year. At a rough estimate, not more than 500 cubic feet per second were flowing past the town on 8th June. An ordinary flood rises 25 to 30 feet, and an extraordinary flood more than 50 feet above the bed of the river. There is a small area under irrigation from a spring, and another small area near the river, irrigated from wells by means of windmills. An erf of 50 yards by 60 yards under the fountain is said to sell for £200. One of the same size near the river, with a windmill, sells for £100, and without a windmill, for £6 to £10. The quantity of vegetables produced is said to be quite inadequate for the requirements of the town and neighbourhood.

9. The Mayor and members of the Municipal Council called upon me with reference to the possibility of taking out a canal from the Orange River for the irrigation of land in the vicinity of the town, more especially at Spitzkop, where there are said to be 3,000 acres of good arable land lying at a height of 60 feet above the bed of the river. I promised to have the necessary surveys made. I find, however, from careful surveys which were made in 1888 that for 31

miles above Prieska the river has a fall of only 1·8 feet per mile The prospects, therefore, of being able to command the land at Spitzkop by means of a canal less than 50 or 60 miles in length are not at all promising, and in the rugged country which adjoins this portion of the Orange River, a canal 50 miles long for the irrigation of a few thousand acres would not be a paying proposition. Mention was also made of Sir William Wilcocks' proposal for taking out, at some point about midway between Colesberg and Hope Town, a canal which would tail into the river near Prieska. From surveys which have recently been made of the Orange River between Petrusville and Hope Town, and from my inquiries and inspection of the country, it seems certain that no canal, from this or any higher portion of the Orange River, which is taken out of the trough of the river, is at all likely to repay its cost unless it can be taken into the valley of the Brak River; and it is highly improbable that it would pay to carry a canal from that valley for the irrigation of the small area of irrigable land near Prieska. The chances, therefore, of the waters of the Orange River being utilised for irrigation in the immediate vicinity of the town are extremely remote. Even for pumping from the river, owing to its width, to the depth of its ordinary water surface below the irrigable lands, and to the great height of its floods, the conditions are unfavourable. The attempt was made by a resident of Prieska some years ago in a very bold and skilful way; but a high flood carried away the pumping house and machinery, and the attempt has not been repeated. The rainfall is too small and precarious for any reliance to be placed upon storage works. Thus, for any extension of its irrigation, Prieska in all probability, will have to depend upon its underground supplies.

10. *Marydale.*—The village of Marydale, which we passed on our way to Buchuberg, has recently been laid out by Mr. Gert Sneyman. Above the village lands, in the valley in which they are situated, water is found near to the surface in a subsoil of indurated sand. Across the valley Mr. Sneyman has driven a tunnel, 2½ feet wide by 6 feet high, for a total length of 300 yards. The bottom of the tunnel is 11½ feet below the surface. The water which percolates from the side of the tunnel flows towards its lower end, whence it is conveyed by means of an open cutting, 1,200 yards in length, to a small dam, situated immediately above the village, from which it is led on to the irrigable lands. An observation which I made showed a flow in the channel of 2,700 gallons per hour, and from this about 16 acres are under irrigation; but only about half that area can be irrigated from November to March. Mr. Sneyman is contemplating an extension of the tunnel to a point 1,500 yards higher up the valley, and this should add considerably to the supply. At Brakbosch Poort, and at other places in the valleys on the northern slope of the Kaaing Bult, similar works could no doubt be profitably made, and utilised for the irrigation of small areas.

11. *Buchuberg.*—About 50 miles below Prieska the Orange River flows round the northern extremity of the Ezelberg range, and about 10 miles lower down in its course it cuts through the Buchu-

berg Hills. Immediately to the west of the Ezelbergs, the southern frontage of the river, for a length of 70 miles, is divided into eleven farms, all of which, with one exception, are Government farms which have been reserved for irrigation. The irrigable lands lie along the bank of the river in a strip of such a narrow width that a canal 76 miles long, extending the whole length of the farms, would command a total area of only 6,600 acres, or less than 100 acres per mile. In 1895 a survey was made and an estimate was prepared for a canal 36 miles long to irrigate, 2,800 acres in five of these farms. The canal was to take off from above a weir 12 feet high, the cost of which was estimated at £12,600. The whole cost of the canal was estimated at £110,000, or about £40 per acre. The scheme was therefore abandoned.

12. There can be no doubt, however, that an irrigation scheme is urgently required to assist in the development of this backward part of the country for there is practically no cultivation within a radius of 100 miles. Obviously there is no hope of constructing here a work which will yield a large return to Government; but it seems possible that a small canal could be constructed for the irrigation of about 1,400 acres at a cost which would involve very little, if any direct loss. About 1¼ miles upstream of the site selected for the weir there is a rapid, from above which a canal might be taken off, possibly without assistance from a weir, to irrigate about 1,400 acres in a length of 17 miles. The bulk of the irrigated area would lie along the lower 7 miles of the canal in the two farms of Stofkraal and Keukendraai; and if, as seems not impossible, such a canal could be constructed for about £26,000, or less than £20 per irrigable acre, I think that its construction should be undertaken. The necessary surveys should certainly be made so that the probable cost of the canal be determined.

13. The area comprised in these reserved farms—probably about 120,000 morgen—is a very large one, much larger than is required for any irrigation scheme that is ever likely to be carried out in this tract. The farms extend back from the river for an average distance of 8 or 10 miles. A strip averaging about 4 miles in width from the river would afford ample grazing grounds for future holders of irrigation lots. The frontage of the river should, however, be reserved throughout; a time may come when it will be desired to carry a canal along the whole 70 miles of frontage.

14. *Olijvenshout Drift.*—Still further down the river at a point on the farm of Matjes Rivier, about 15 miles above Upington, there is a site on the river from which a canal could be taken out to irrigate some 1,500 acres. But nearly the whole of this area lies on islands which are liable to submersion by floods. Moreover, as will presently be explained, in the interests of the existing irrigation in Upington the river should be assisted to scour away portions of these islands. In any case, the scheme for the irrigation of this tract would be a more costly one per acre than the Buchuberg scheme, and its consideration may well be postponed until the latter has been fully investigated.

15. *Upington.*—At Upington a canal takes out from the right bank of the river at a point about 12 miles above the town, below which it is continued for another 8 miles. It was constructed by the Revd. Schroeder, the pioneer of irrigation on the Orange River, under a concession from the Bechuanaland Government, the terms of which I have not been able to ascertain. The furrow is 10 feet wide at its head and 2 feet deep, and carries with full supply about 20 cubic feet per section; a supply which should more than suffice for the 1,200 acres which are under irrigation. At the intake of the canal the river is divided by a large island into separate branches. When the river is exceptionally low the canal receives an insufficient supply, although a considerable volume of water passes down the northern channel which is farthest from the intake. A small masonry or concrete dam, about 2½ feet high and 15 or 20 yards long, should be constructed across this branch. It should be provided with an opening of a size sufficient to pass down drinking water for cattle on the farms below. The safety of the intake is being endangered by the demolition of the trees in its vicinity.

16. The furrow is in fairly good order throughout its length, and is maintained without much difficulty or expense, except in a length of about 1,270 yards, where it passes through a sandhill between the intake and the town. The loose sand is blown into the channel and necessitates frequent clearance. The question of laying a 2½-foot pipe, constructed of corrugated sheets, to carry the whole supply through this portion of the channel was under consideration The slope of the bed is much too small to admit of the supply being carried through one pipe of this size, especially with its interior surface corrugated transversely to the flow. To carry the whole supply would require two 2½-feet pipes with smooth interior surfaces with the interior surface corrugated at least three lines of pipes would be necessary. It would probably be cheaper, and give a more durable work to construct a rectangular masonary channel covered with reinforced concrete. The total cost of maintaining the furrow amounts annually to about £300, or 5s. per acre irrigated.

17. Dr. Nobbs in his report on these works has called attention to the damage done by high floods, which scoop out channels in the soft alluvial land. Much of the land appears to have been originally below high flood level, but so long as it was covered by trees and natural growth, the floods passing over it could not acquire sufficient velocity to scour away the soil. With the clearance of the land for irrigation the whole conditions were altered. Not only were the trees and undergrowth removed, but by a process called "spoeling" much of the soil from the higher ground was scoured away into local depressions. In a high flood evidently a large volume of water now finds an unobstructed passage across the irrigable land. These remarks apply particularly to the large tract of land extending for some 3 miles to the west of the church. The only real remedy for this lies in the construction of river training works, and the cost of these would, I fear, exceed the value of the land to be improved. But in the absence of any survey of the river and of the irrigable

lands, and having had no opportunity of observing the river in flood I can make no attempt to form even a rough estimate of the cost of such works, nor to say how far they would be likely to affect the interests of the farms on the opposite bank, on to which the training works would be likely to divert the main stream of the river. Having regard, however, to the interests of Upington alone, the desired result might possibly be obtained by constructing one or two strong dykes near the head of the lands, and by removing the trees which at present protect the islands against any encroachment of the river. These islands obstruct the main channel, and divert the water on to the irrigable lands. The main lesson to be learnt from these works is, I think, that where the alluvial lands along the Orange River are considerably below high flood level, river training works and silting operations should precede the construction of irrigation works. The works required for training the river and inducing a deposit of silt on the low-lying lands can be carried out much more cheaply and effectively, and with much less trouble, before the lands have been cleared and brought under irrigation. Once this has been done training operations are certain to interfere with cultivation, and to give rise to claims for compensation.

18. *Keimoes and Friersdale.*—At Keimoes, 32 miles below Upington, a small canal has been taken out for the irrigation of 1,200 acres, and has proved a very successful undertaking. The soil is exceptionally good even for the Orange River, where all the alluvial soil is exceedingly fertile, especially that on the islands. At Friersdale, 12 miles lower down the river, there is another very successful little irrigation settlement with about 200 acres under irrigation, and cultivated by the tenants of the Keimoes estate. For irrigated vineyards they pay an annual rent of £6 per morgen.

19. *Kakamas.*—I have nothing to add to the very interesting reports which Dr. Nobbs submitted last year with reference to the labour colony at Kakamas, beyond stating that the actual works appear to have been carried out successfully, and that so far as I could gather, in the absence of any plans or surveys, their future success seems to be assured. The colony now supports over a thousand people, of whom 800 are white. Some of them, judging from the neat and roomy cottages already built, are evidently doing well. About 600 morgen are under irrigation. Portions of the land however, are below flood level and, as at Upington, the process of levelling and clearing is bound to give easier flow to the water and to draw the floods in greater volume on to the land. Mr. Schroeder evidently realises the danger, and proposes to grow quince hedges round every erf in order to obstruct the flow. Time did not admit of my inspecting the river at the point where the floods break in. If a survey were made at this point it might be possible to propose some means for diverting the floods away from the land at a reasonable cost. In fact a survey should be made of the whole canal, the irrigated lands, and adjoining portions of the river.

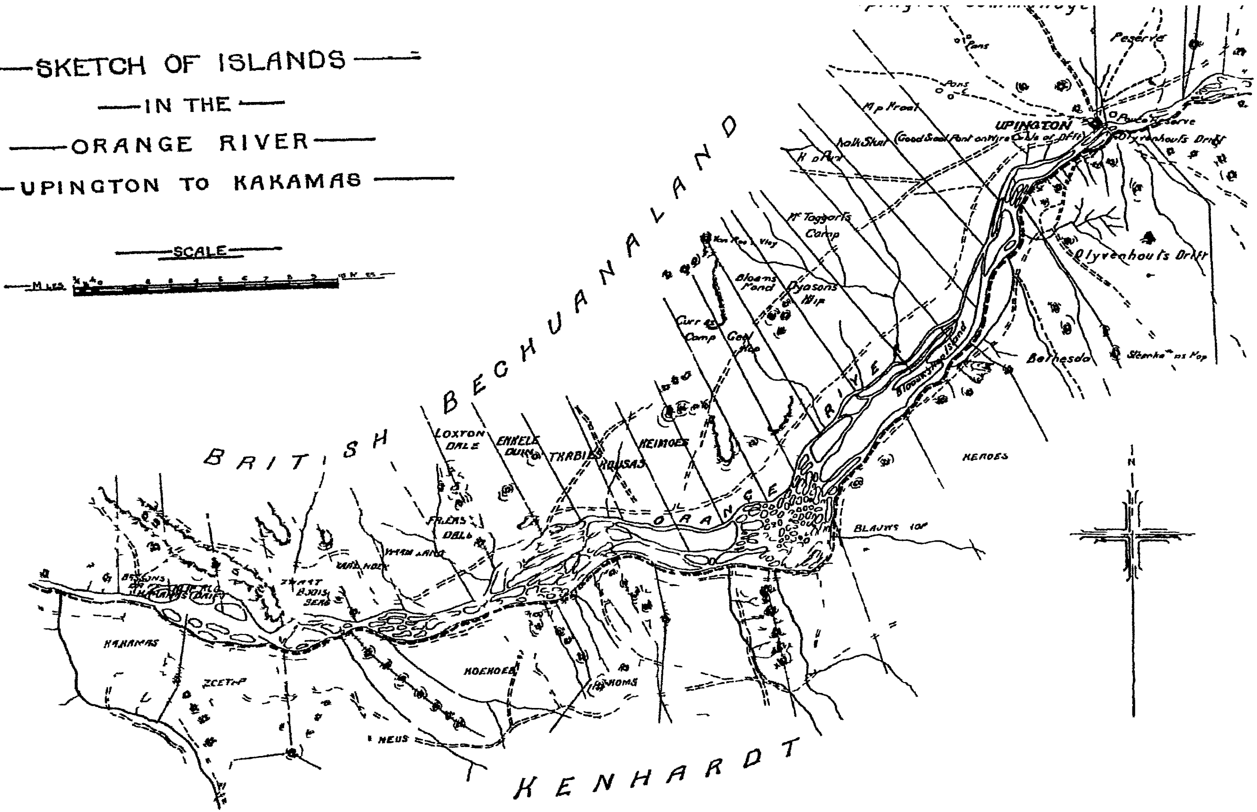
20. There are more than 60 morgen of good irrigable land in the police reserve, for which I understand rights to water from the

irrigation furrow have been secured. No time should be lost in bringing this valuable land under irrigation.

21. *The Islands of the Orange River.*—From Swartzkop, six miles below Upington, the river runs in a wider trough. The hills bordering it on either side are farther apart, and instead of being confined, as in its upper reaches, to one channel in a narrow gorge, it has free play to wander over a valley from 2 to 6 miles in width, an occasional isolated kopje being its only obstruction. In this broad valley the river, flowing with reduced velocity, has deposited its silt, and formed on each side of its present main stream a series of islands, intersected by innumerable sluits down which the water spills when the river rises in flood. Many of these islands, as at Bloemzemond, are rarely flooded; others, as at Kakamas, are topped by an ordinary high flood. Their dense growth of bush and trees, the grain crops of Keimoes, and the vineyards of Friersdale afford ample testimony to their fertility. I doubt if in the whole of this colony there is a more fertile soil, or, given a population and a market, one that would more abundantly repay the cost of bringing it under irrigation. The water is there, and it has only to be raised a small height to bring it on to the land. But in the case of many, if not most of the islands, merely clearing the land of trees and bringing it under irrigation would leave it at the mercy of the first big flood and lead to inevitable disaster. Whatever may be possible on the adjoining main land, on these islands, where not only the bulk, but also the best of the land lies, river training and silting operations must precede irrigation works if these are to be successful, and if the best use is to be made of the available land. Before the land is cleared, dykes of trees, stone, or earth with stone groynes, must be constructed, and the flood water made to spill over the land in controllable volumes, and deposit its silt before it passes back to the main channel. By this means the sluits would be filled with silt, and the general level of the land would be raised above that of any ordinary high flood. Subsequently those islands which at present obstruct the main channel should be cleared of trees and undergrowth. The river would then scour them away, and in this widened channel the floods could pass without spilling over the irrigable lands.

22. There are no data on which to form an estimate of the cost of such works in the colony, and there will have to be a larger population and readier access to outside markets before it will pay to bring any large area under cultivation in this tract, but at present I see no better prospect than these islands seem to afford of utilising the Orange River for the irrigation of any considerable area. The conditions certainly seem sufficiently promising to justify an experiment on as small a scale as is compatible with a work of the kind. The islands, a portion of which is shown on the attached sketch plan, extend along the river for a length of 60 miles. At a very rough estimate they, together with the alluvial tracts on the adjoining main land, comprise at least 60,000 acres of irrigable land, an area sufficient to utilise the greater part of the late winter and early

SKETCH OF ISLANDS
IN THE
ORANGE RIVER
UPINGTON TO KAKAMAS



spring flow of the Orange River. The first requirement, however, is a proper survey of the islands and river.

23. Dr. Nobbs has called attention to the uncertainty that exists regarding the ownership of the islands. Most of them appear to be undoubtedly crown land, but some at least are claimed by the owners of adjoining farms. This uncertainty has already led to difficulties, and these are bound to increase with the improvement of communications and the opening up of the country, unless steps are taken to have the boundaries clearly laid down. At the same time the question as to the possession of riparian rights by the owners of the farms which are bounded by the inner bank of the river should be investigated and decided.

24. *Rivergauges.*—Gauge posts for recording the height of the river should be erected at Buchuberg, Upington, and Kakamas.

THE ROOIBERG DAM.

25. The dam at Rooiberg was constructed across the Hartebeeste River in 1898—99, at a total cost of about £47,000, inclusive of the amount spent in relief work, the necessity for which had led to the construction of the dam being hastily undertaken. The officer first in charge of the work lost his wife from typhoid fever. The engineer who succeeded him was laid up with typhoid for three months, and shortly afterwards his wife fell ill from the same cause, The work, therefore, was evidently carried out under considerable difficulties. The dam proper is an earthen one, 2,692 feet in length. The level of the top of the bank is 23½ feet above that of the river bed. Two overflows are provided, one on the west bank 418 feet long and one on the east bank 650 feet long, making a total length of 1,068 feet. The crests of the overflows are 8 feet below the top of the bank. The reservoir has a storage capacity below crest of 250 million cubic feet, and the water at crest level would cover 900 acres of ground and extend back for a distance of 2 miles above the dam, with an average depth of 6·4 feet only. A few months after the dam had been completed an unprecedently large flood came down the river. It reached the dam on Saturday, the 24th March, 1900, and on Monday, the 26th between 1 and 2 p.m., the water reached the overflow. At 6 p.m., there was no sign of any leak through the dam. At midnight, when the water was 1½ feet on the overflow, the dam breached at a point about 850 feet from its eastern extremity. The breach is now 100 yards wide.

26. Some days before visiting the site I had sent instructions to to have a vertical trench excavated down the centre of the bank on each side of the breach, and a well dug in the centre of the bank midway between the breach and the western flank. An examination of these showed that up to a height of 10 feet above the bed of the river the dam had been properly constructed, and the material composing it well consolidated. Above that height there was a distinct change—the earth had evidently been loosely thrown up in 12 inch layers, the clods

were not broken, nor was the material consolidated. With a dam constructed in this way it is quite possible that there was an exceptionally weak spot somewhere, and in all probability this was the cause of the breach.

27. A Select Committee of the House of Assembly, appointed in July, 1903, to inquire into the accident, reported that the cost of making the damage good would not be less than £6,000, and that the further cost of making the necessary channels for conveying the water to the lands to be irrigated would amount to another £6,000. They were of opinion that the Government should in the first instance offer favourable terms to any public body who would be prepared to undertake the responsibility of reconstruction; and that if this failed they should be prepared to treat with private individuals or companies who would, under guarantee, take over the works and secure their proper utilization.

28. The first option was to be given to a public body perhaps with the hope that the work might still be utilised for the formation of an irrigation colony. Whatever may have been the intention of the Committee in this respect, I venture to think that the formation of an irrigation colony is not an object for which the dam should be repaired. A shallow storage reservoir dependent for its supply upon an annual rainfall of less than 5½ inches seems to be the last kind of work upon which an irrigation colon, especially one composed of poor whites, should be made to depend. It may be argued that though the rainfall is small, the enormous size of the catchment area draining into the river above the dam, over 27,000 square miles, will ensure the annual replenishment of the reservoir. It is, however, only about once in twenty years that any of the water in the Zak River passes the large vleis above Lemoen Kop, which cover an area of over 200 square miles. Similarly, if my maps and information are correct, the large pan known as "Verneuk Pan" probably absorbs all or more of the drainage brought down by the Olifant Vlei River in ordinary years. While, therefore, the dam is subject to a very occasional high flood from a catchment of over 27,000 square miles, it is practically dependent for the periodical replenishment of its supply upon an area of about 1,500 square miles.

29. There have been no river flow observations, and in estimating the chances of the dam's filling or its liability to failure, all we have to depend upon is the rainfall recorded at Kenhardt, the only rainfall station in the proximity of the effective catchment area. I attach a statement of the rainfall at that station from November, 1879, to September, 1904. If these figures may be taken as a fair average for the catchment of the Rooiberg dam, the main fact to be deduced from them is that the tract is liable to long periods of drought, during which no water would flow into the reservoir. In all probability there was no flow, or practically no flow, in the river from March, 1882, to the last week in April, 1883 (14 months); from March, 1887, to December, 1888 (22 months); from March, 1898, to January, 1900 (23 months); from November, 1901. to January, 1904 (27 months). I do not advise that any attempt should be made

to found an irrigation colony by means of a storage work which seems liable to such frequent and prolonged droughts as these.

30. As an adjunct to stock forming, the dam would, however probably prove a useful work. In years in which it filled it would supply sufficient water for the irrigation of over 750 acres. The cost of repairing it would undoubtedly be less if done by a private individual than if done by Government, and I would suggest therefore that tenders be invited for the purchase of the dam as it stands with the farm or farms which are attached to it; and that the dam and irrigable lands be sold under conditions which will prevent their being utilised for the formation of an irrigation settlement, at any rate until experience has shown that the supply of water is more regular and assured than is indicated by the rainfall returns.

VAN WYK'S VLEI.

31. The dam at Van Wyk's Vlei was completed in 1883. It collects the drainage from a catchment area of about 800 square miles, over which the mean annual rainfall is probably about 6½ inches. The embankment is 35 feet high, and if filled to a depth of 27 feet the reservoir would hold up 5,600 million cubic feet of water. Mr. Gamble, who designed the dam, foresaw that in all probability the reservoir would never fill owing to the insufficiency of the rainfall. But he purposely made the top of the embankment at a high level in order to lessen the cost of the overflow. The existence, in the valley in which the dam was constructed, of a layer of stiff pot clay at a small depth below the surface was also noticed, but its full significance was not recognised. Nor is this to be wondered at. Twenty years ago the great importance of free subsoil drainage for irrigated lands, especially where the land is brak, had not been realised in this country. I doubt if it is fully realised even now.

32. The total capital expenditure on works amounts to £25,622 inclusive of the cost of land and of a supply furrow 9 miles long from the Carnarvon River. This furrow was constructed in 1890 after a few years of drought had shown the insufficiency of the supply from the catchment of the dam. The irrigable lands consist of about twenty small garden plots, and 500 morgen of arable land divided into fifty plots of 10 morgen each, The arable lots lie close to the Carnarvon River, at a distance of 5 miles from the dam. In the portions of these lands which I inspected, the subsoil as indicated in the adjoining wells, consisted of sand and pebbles to a considerable depth. With a subsoil of this kind, and with free drainage therefrom, there need be no fear of brak. At the garden lands which are situated about 1½ miles from the dam, the subsoil of pot clay is sufficient to account for the rapid deterioration of the land under irrigation. The regulations for the distribution of water issued in 1888 are just what is required where the supply of water is so uncertain. The Bailiff is allowed a free hand, and the charge is made for each separate watering, at the rate of 7s. 6d. per morgen.

The area under irrigation varies with the supply in the reservoir, between *nil* and 600 morgen.

33. According to Dr. Nobbs's report of August, 1903—a report which gives a great deal of information which I need not repeat—the annual receipts for water-rates, grazing, sale of salt, etc., average £415, showing an annual loss of £28 exclusive of interest on capital. Including interest the annual loss may be taken roughly at £1,000 So far as I can see no appreciable reduction can be made in this loss. The only source from which the supply of water could be increased is the Carnarvon River, which according to Mr. Gamble drains an area of about 850 square miles above the point from which the supply furrow takes off to the reservoir. This furrow at present can carry only a very small supply, probably not more than 100 cubic feet per second. It was never excavated to a sufficient depth, and in places the width is only 20 feet, instead of the 30 feet for which the channel was designed. In many places the side of the hill has been levelled off with practically no excavation at the outer edge. The excavated material was thrown on the lower side of the hill, and forms a weak embankment in which breaches almost invariably occur when the river comes down.

34. I left Van Wyk's Vlei under a strong impression that by remodelling the furrow a good deal could be done to improve the supply to the reservoir. More detailed information with respect to the number and duration of the floods in the Carnarvon River has, however, caused me to alter my views. From the Bailiff's monthly reports, I gather that during the last eight years the river has been in flow only twelve times, and for 36 days in all. The past four years have no doubt been exceptionally dry, but even allowing for this, it would not seem safe to count on a supply from the Carnarvon River for more than four days in an average year. Deepening the furrow to make it carry safely 300 instead of 100 cubic feet per second, and providing overflows for excessive floods. would probably cost £6,000. The additional supply to the reservoir would not amount in an average year to more than 100 million cubic feet, sufficient perhaps for the irrigation of 500 acres. The cost would therefore be about £12 per acre, or £24 per morgen—a sum greatly in excess of the present value of the land. If then my estimate as to the number and duration of the floods in the Carnarvon River is at all correct, the advantage of drawing an increased supply from it will not justify the cost, unless it be found possible to hold up the waters of the river by means of a regulating dam from which the furrow would gradually draw off the impounded water. I am doubtful indeed if the expenditure at present incurred on maintaining the furrow, amounting I understand to about £100 per annum, can be justified. This is a question which I shall consider during my next visit to the estate. Meanwhile the Bailiff should continue his observations of the depth of water at a fixed point while the channel is in flow.

35. It is unfortunate that the village and garden lots were laid out in brak soil with an impervious subsoil, and that they have to be

supplied by means of a separate furrow, instead of having one furrow for both the arable and garden lands. The irrigation of the gardens has practically ceased owing to the deterioration of the soil. But a few of the lots still take water, and to supply these, and to afford a supply for domestic purposes, the village furrow has to be opened periodically, leading to the waste of a considerable volume of water. Moreover, so long as the residents of the village and the cultivators of the arable lands continue to dwell three or four miles apart there is not likely to be much co-operation between them. Were it not for the uncertainty as to the effects on the village of Van Wyk's Vlei of the construction of the railway to Carnarvon, it might be worth considering whether it would not be possible to change the site of the village to a more suitable place near to the arable lands. But I was assured, by more than one of the residents, that with the advent of the railway the village was doomed, as the cultivators could not hope to compete with the imported wheat when the railway came within 40 miles of them. This no doubt is too gloomy a view to take of the future; at the same time I cannot but think that there is some ground for apprehension, Even on the Douglas canal, where the railway is 48 miles away, wheat is only grown in small quantities for home consumption. No locally-grown grain is brought to the market. And, generally, it seems to me that the only really profitable irrigation works in the Colony of any size are those which are either close to the line of rail or more than 100 miles away, Where wheat can be cultivated as cheaply, and will yield such an out-turn as it does on the Zak River, a railway would be welcomed as opening up a market; but it is a different matter at Van Wyk's Vlei, where much of the soil is not of the best, where the scanty supply of water contains no fertilising silt, and where the average yield is only ten to one. With a railway to Carnarvon, wheat grown at Van Wyk's Vlei will no longer sell for 30s. to 50s. a bag; and certainly the prospects of the settlement are not very hopeful unless something can be done to increase the yield of the land at a reasonable cost. Substituting fruit and vegetable crops for wheat is out of the question. The local market for such produce is too limited, and the railway, though near enough to injure wheat cultivation, will still be too far away to encourage the cultivation of these more valuable crops. Lucerne will probably prove to be the most paying crop, and should be given a trial.

36. In order to increase the yield of grain, so far as irrigation is concerned I have only two suggestions to make. One is that instead of working on the same plot of ground year after year, the cultivators should be allowed to select another plot of 500 morgen divided into 50 lots, and to cultivate this free of charge every other year. The plot would have to be in one block so as to avoid waste in the distribution of the water. This would give the land a chance, by allowing it to lie fallow for a time. I think also that something might be done to utilise the water of the Carnarvon River by turning it out and holding it up until sowing time in small "saai" dams, as is done so extensively on the Zak River. There is plenty of good

arable land along the river, and I can see no reason why if saturated in this way it should not yield a fair crop. The river might even be turned on to some of the arable lots where saai dams might be made, and in many years this would do away with the necessity of a first watering, while at the same time the land would derive benefit from the silt of the river. Mr. McMillan, the Bailiff, is anxious to make experiments in this direction and he should be encouraged to do so. It would be well if, before starting operations, he could pay a visit to Tontelbosch Kolk on the Zak River.

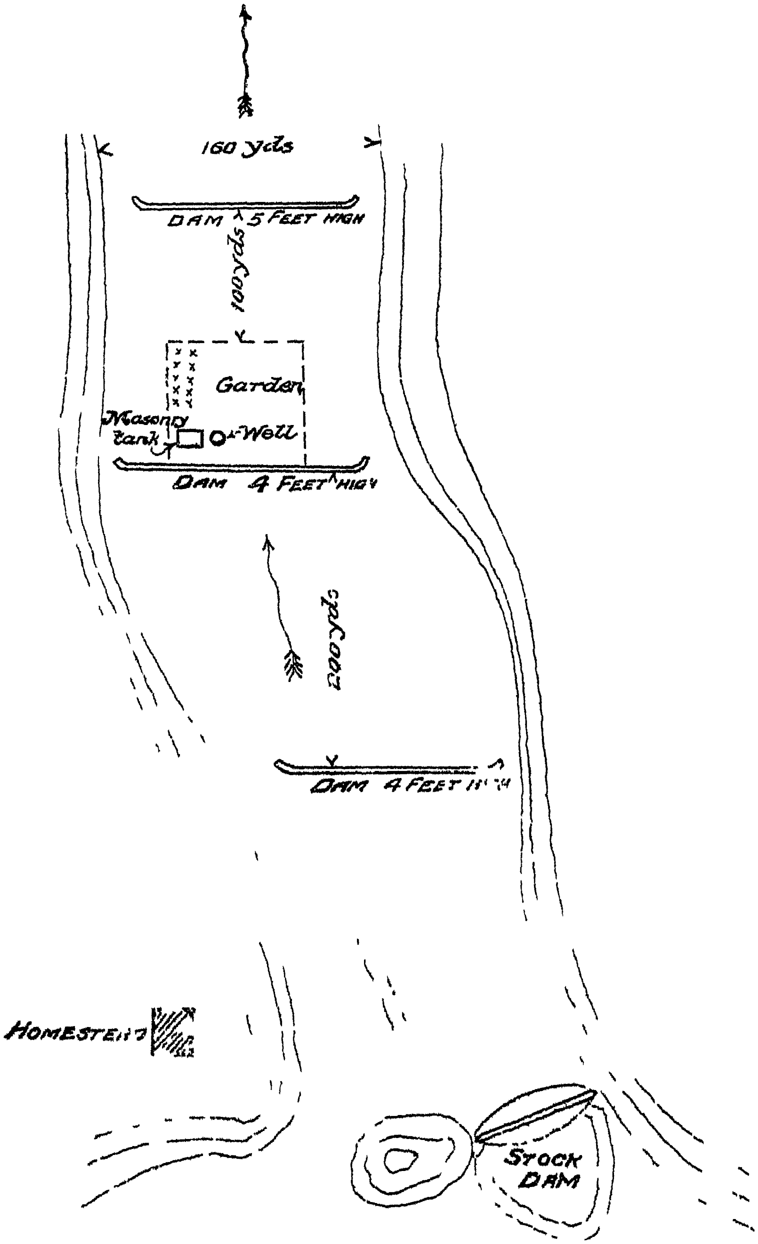
37. It would, I consider, be advisable to have these experiments carried out, and to obtain more definite information as to the possibility of making better use of the Carnarvon River, before the changes in management suggested by Dr. Nobbs are carried out, although there is much to be said for his recommendations. The management of all works of this kind should no doubt sooner or later be handed over to the people directly concerned.

38. On the whole, although the work has yielded results which are small compared to the expenditure incurred upon them, I have been agreeably surprised with what I saw at Van Wyk's Vlei. From what I had heard and read I scarcely expected to find at that place nearly 1,000 acres under irrigation in one block; and there is no doubt that this irrigated plot, in the centre of a large tract which is far removed from the railway, has rendered material assistance in the development of the country. The excellent manner in which the works were constructed has long been recognised.

SAAI DAMS AND WELLS.

39. On the road from Van Wyk's Vlei to Brand Vlei I met, for the first time in this country, a form of irrigation which is very extensively used in India. It consists of low embankments, thrown across a flat valley or plain so as to hold up water on the land, and thereby ensure a sufficient supply of moisture in the soil for the germination and sustenance of a crop. Here these embankments are known as "saai dams." On my first arrival I was assured by more than one person that there were no such works in this country, and indeed until I visited these north-western districts I saw but few places where the local conditions favoured their construction.

40. *Uitspan Kop.*—The arrangement of the "saai dams" and irrigation works on Mr. Breuwer's farm of Uitspan Kop is shown on the attached sketch. Close to the homestead there is a vlei, 100 to 150 yards in width, which carries the drainage of the surrounding hills into the Hartog's Kloof River. Across this vlei Mr. Breuwer has constructed four or five small embankments, the highest of which is only 5 feet high. These hold up the flood waters to a maximum depth of 3 or 4 feet. The banks are carried into the higher ground on either side, where, however, room is left for the flood waters to pass. Below one of the banks Mr. Breuwer has laid out a garden, 1 morgen in extent. In one corner of this he has sunk a well 28 feet deep. In this a noria or "bakkies" pump is worked by two donkeys. The water is led into a masonry tank (25 feet by 20 feet



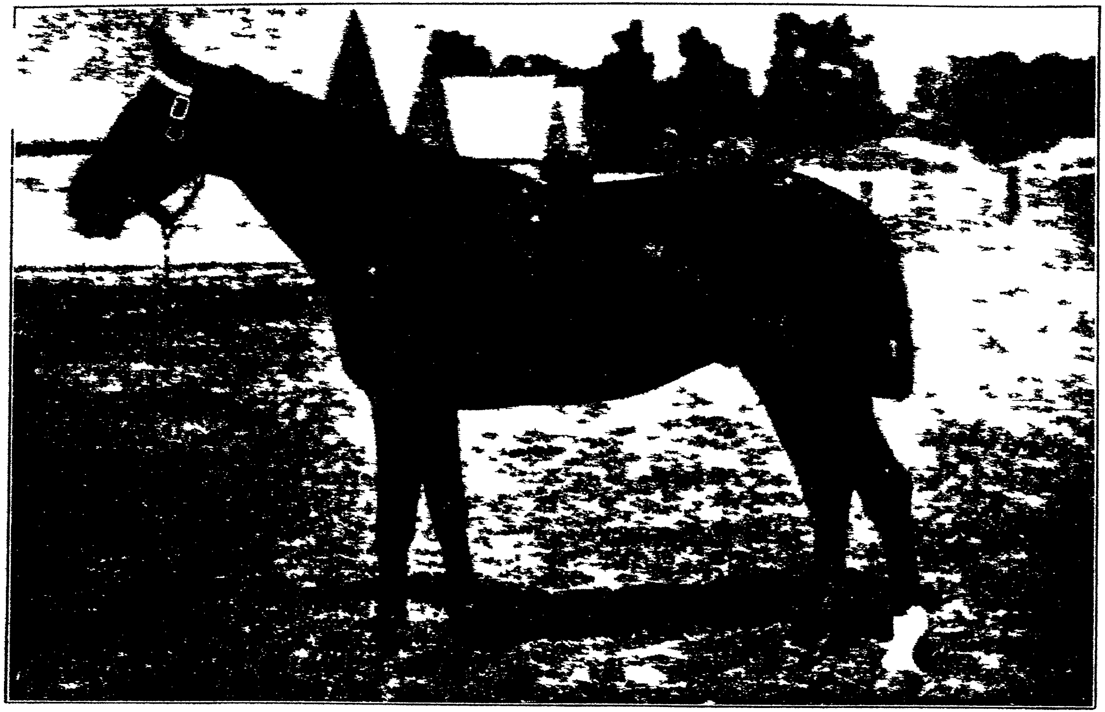
Sketch of Saai Dams
and garden at
Uitspan Kop

by 3 feet). After a year of good rainfall the water in the well is only 12 feet from the surface of the ground, and the pump can be worked all day. In drought it sinks to 20 feet, and the pump is worked for only half the day. In the garden Mr. Breuwer grows vegetables, apples, pears, peaches, almonds and figs. Above the banks, after the water has receded or been drawn off, he sows three bags of wheat in an area of about 6 morgen, from which in a good year he reaps 150 bags of grain. One flood ensures him a fair crop, and one good crop was more than sufficient to repay the cost of the banks.

41. *Abiqua Puts.*—At Abiqua Puts Mr. Schalkwyk, in a vlei 300 yards wide, by constructing similar saai dams has brought an area of about 30 morgen under cultivation. In one year, on a plot of ground 250 yards square, he sowed 203 lbs. of wheat, and reaped 103 muids. One of the stools of wheat which he showed me was 7 feet high, and the ears were large and well filled. Over a portion of the area at the lower end of the lands there was a thick efflorescence of white brak; but Mr. Schalkwyk assured me that one flooding washed this away and that even this part of the land yielded excellent crops. In a small garden of 1 acre in extent, situated in the higher ground adjoining the lands, there is a well in which, as nearly as I could ascertain by means of an Abney's level, the level of the water is only 3 feet below that of the cultivated ground opposite to it. A small cut would deliver the water to a pit in the cultivated lands, from which it could easily be lifted on to the surface of the ground. Like Mr. Breuwer, Mr. Schalkwyk testified to the benefits which he had derived from his saai dams.

42. Throughout our journey we constantly crossed or drove along vleis which seemed eminently suited to the construction of these dams. I do not think it is an exaggeration to say that there are few farms in this part of the country where the farmer, if he followed the example set by Mr. Schalkwyk and Mr. Breuwer, could not grow sufficient fruit, vegetables, and grain for his own household and farm hands. For the growth of grain the only requirement is a fairly wide vlei down which flood water finds its way in a year of ordinary rainfall, with a longitudinal slope of not more than 1 in 300, and with a good depth—at least 5 or 6 feet—of fertile and retentive soil. A vlei of this kind is to be found in almost every farm which we passed through in the valley of the Zak River. For the fruit and vegetables a well is necessary, and there are no doubt many parts of the valley, especially between Kenhardt and Van Wyk's Vlei along the southern slope of the Kaaing Bult, where the underground water is at a considerable depth and affords only a scanty supply; but there are other parts, more especially along the northern slope of the Bult, and in the southern and higher portions of the Fish and Zak catchments, where, even after a drought extending over three years, the subsoil water is still within 15 or 20 feet of the surface. Wherever it is to be found within 20 feet it will pay the farmer to sink a well and raise the water by means of a noria pump. Windmills for irrigation purposes are a luxury, which at their present price probably only pay in the vicinity of a town or line of rail.

HUNTER GELDING



First Prize Royal Show London, 1904
Exhibitor Lord Revelstoke

THE ROYAL AGRICULTURAL SHOW OF ENGLAND, 1904.

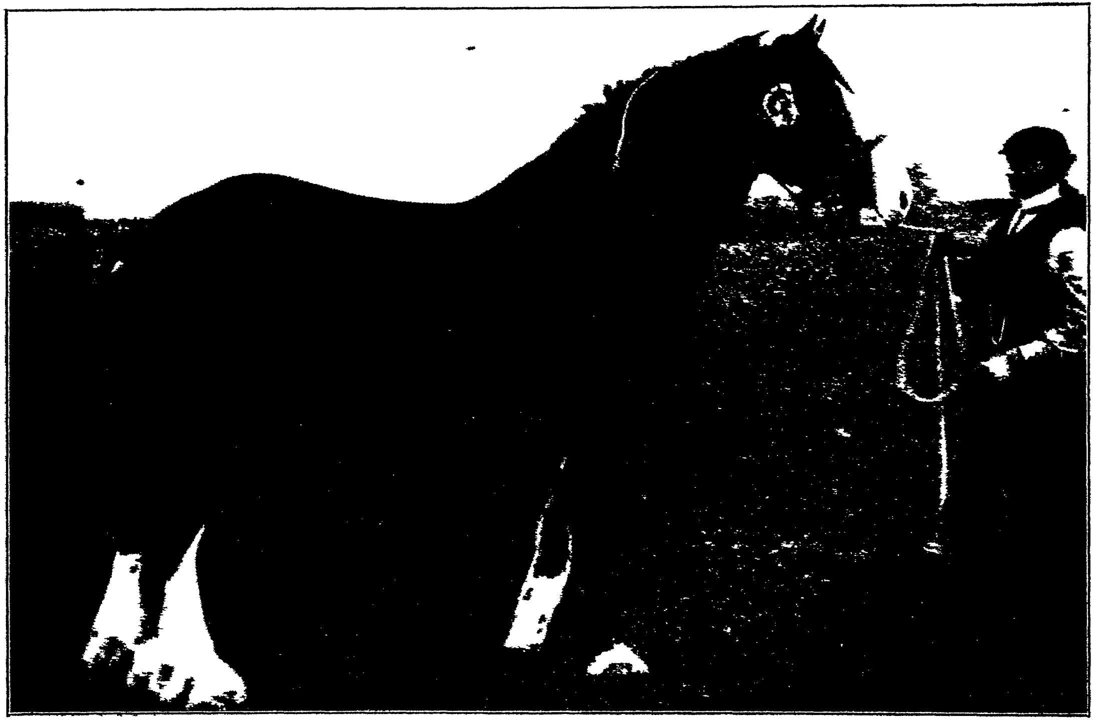
SOME CHAMPIONS AND PRIZE WINNERS.

The Royal Agricultural Show of England for 1904 was the 65th exhibition of that description held by the Royal Agricultural Society, and though not a great financial success, as judged by modern standards, it drew a magnificent display of everything that delights the farmer's heart. The most important features of these magnificent annual exhibitions is undoubtedly the grand collection of farm stock of every description which they attract. England, as the home of the greatest stud breeding industry of the world, is expected to make a grand display on such an occasion and never is the visitor disappointed. In every class of farm stock the finest types may be seen at these Shows and no greater educative factor exists for the stockman then a visit to one of them. It is not in our power to bring before our readers all the features of the last shows, but thanks to the courtesy of Messrs. Cooper and Nephews, who take so great an interest in stock-breeding that they have published an excellently got-up little book on the stock side of that important function, entitled "The Royal Show of England and its influence on Stock-Breeding," we can give our readers the benefit of some of their illustrations. The book itself is obtainable of the Cooper agencies throughout the Colony, and should be in the hands of all stockmen who desire to know the best type of the various breeds of cattle, horses and pigs particularly. With the exception of the Shropshires the sheep in the book will appeal to a very limited audience in this Colony. The illustrations herewith speak for themselves, and may prove of service during the Show season now upon us, for many disputes arise on minor points which would be dismissed at once were there a good illustration of the correct type of animal available to refer to.

HACKNEY STALLION.

First Prize and Champion Gold Medal Royal Show London 1904
[illegible] by Sir Walter Gilbey Bart

CLYDESDALE STALLION.



First Prize and Champion, Royal Show, London 1904
Exhibitors, Messrs A and W Montgomery

SHIRE STALLION.

First Prize and Champion Gold Medal, Royal Show, London 1904.
Exhibit 1, Mr Philo L Mills

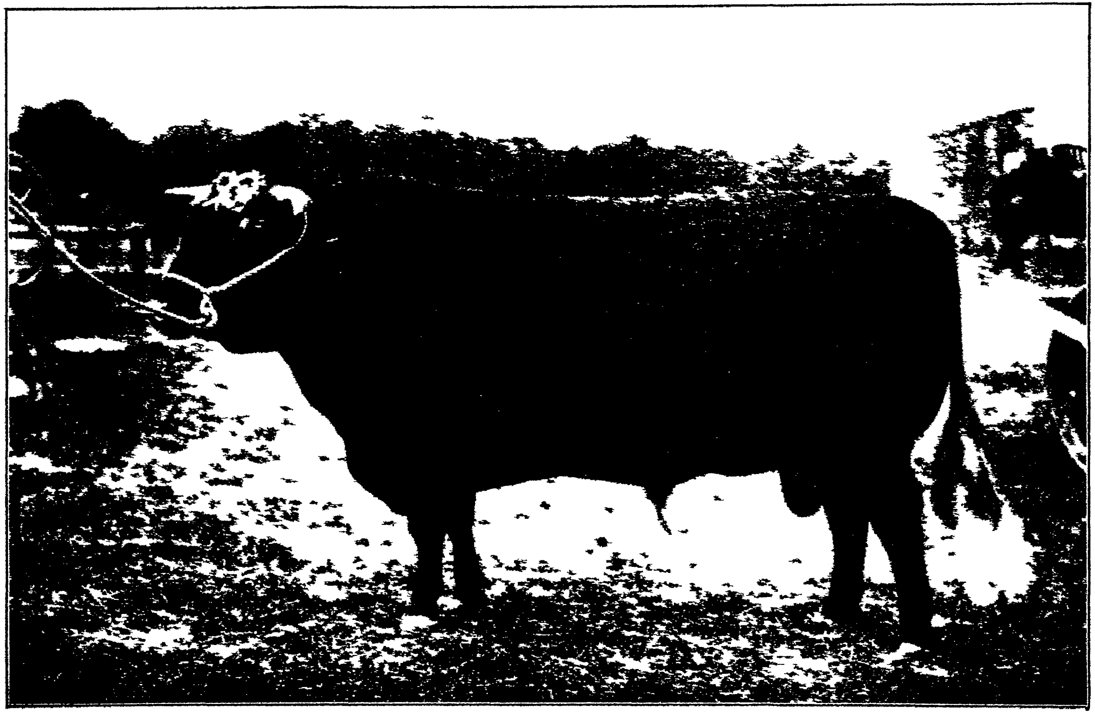
SHORTHORN BULL "RONALD."

First Prize and Champion, Royal Show, London, 1904
Exhibitor His Majesty King Edward VII

HEREFORD BULL.

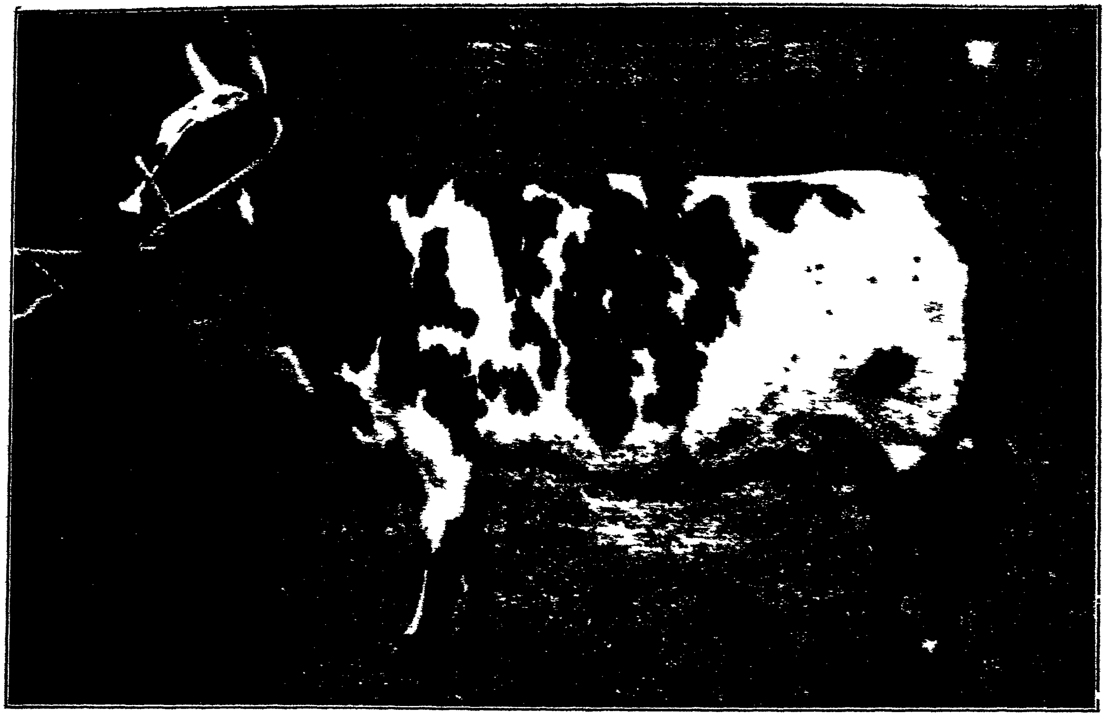
First Prize and Champion, Royal Show, London, 1904.
Exhibitor, His Majesty King Edward VII

DEVON BULL.



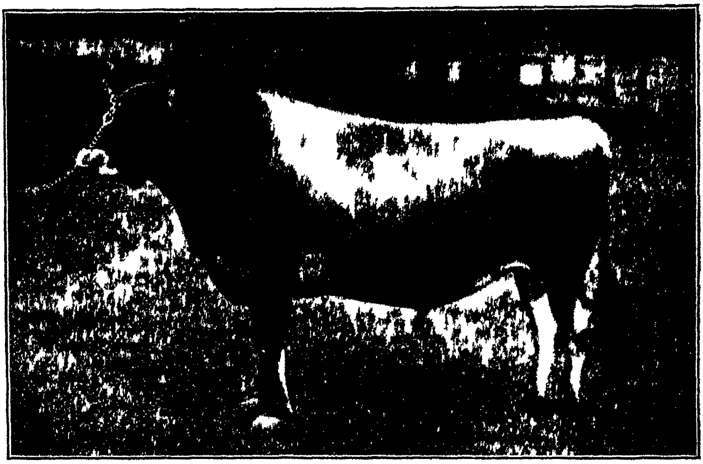
First Prize and Champion, Royal Show, London 1901
Exhibitor Mr T C Williams

AYRSHIRE COW.



First Prize, Royal Show, London, 1904
Exhibitor, Mr Alexander Cross

JERSEY BULL.

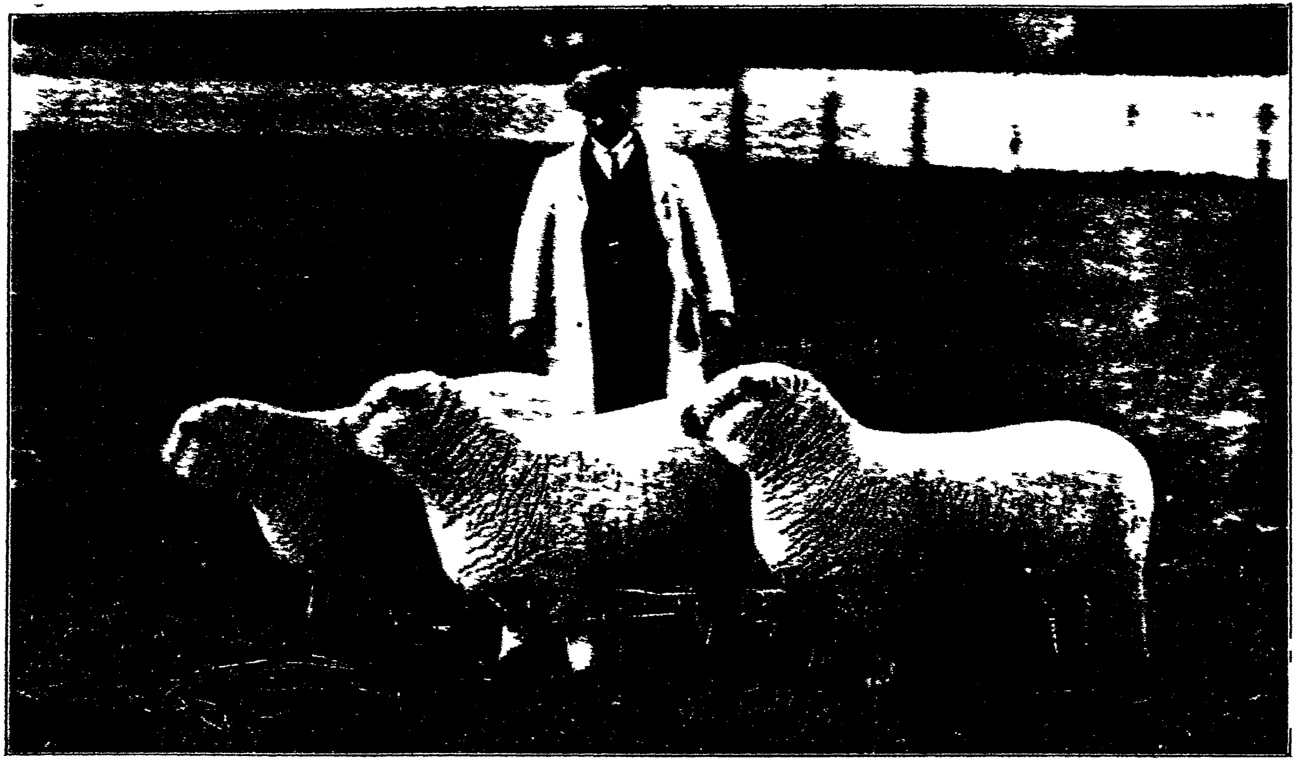


First Prize Royal Show, London 1904
Exhibitor, Mrs Charlotte McIntosh

SHROPSHIRE RAM LAMBS.

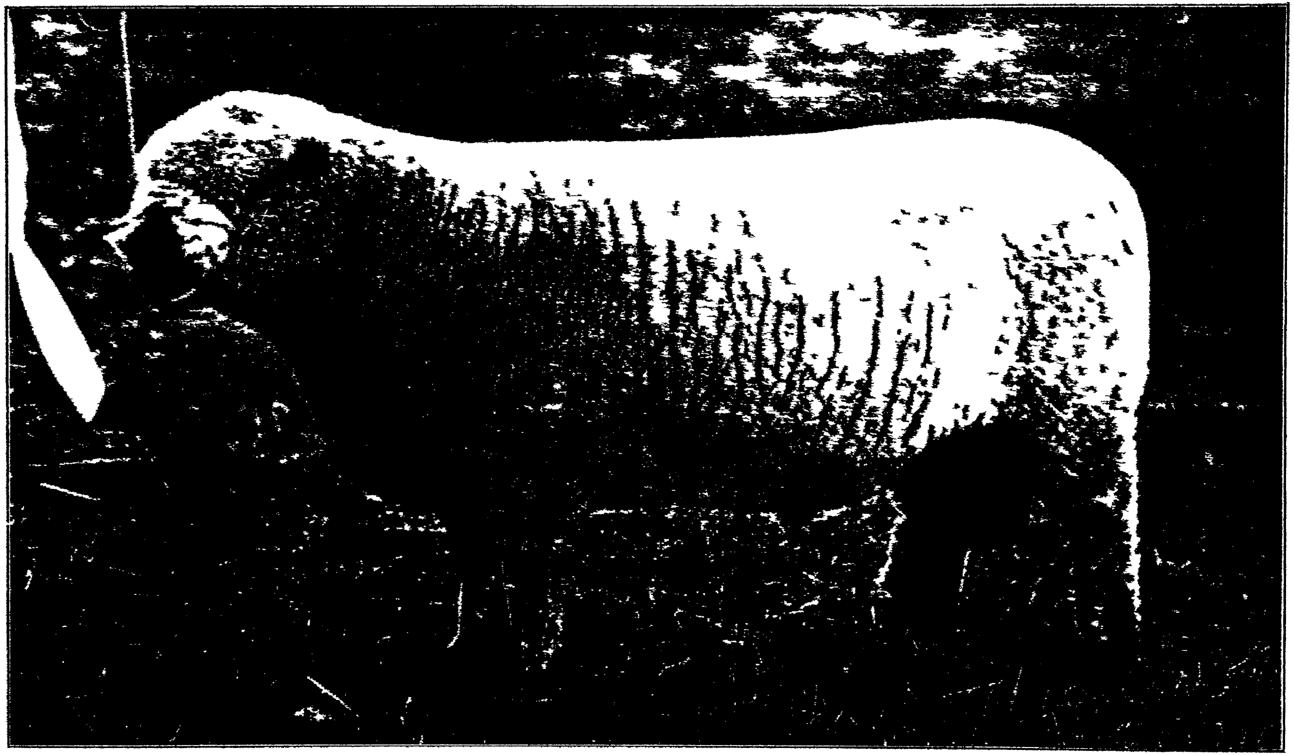
Second Prize Royal Show, London 1904
Exhibitors The Proprietors of Cooper's Dip

SHROPSHIRE SHEARLING EWES



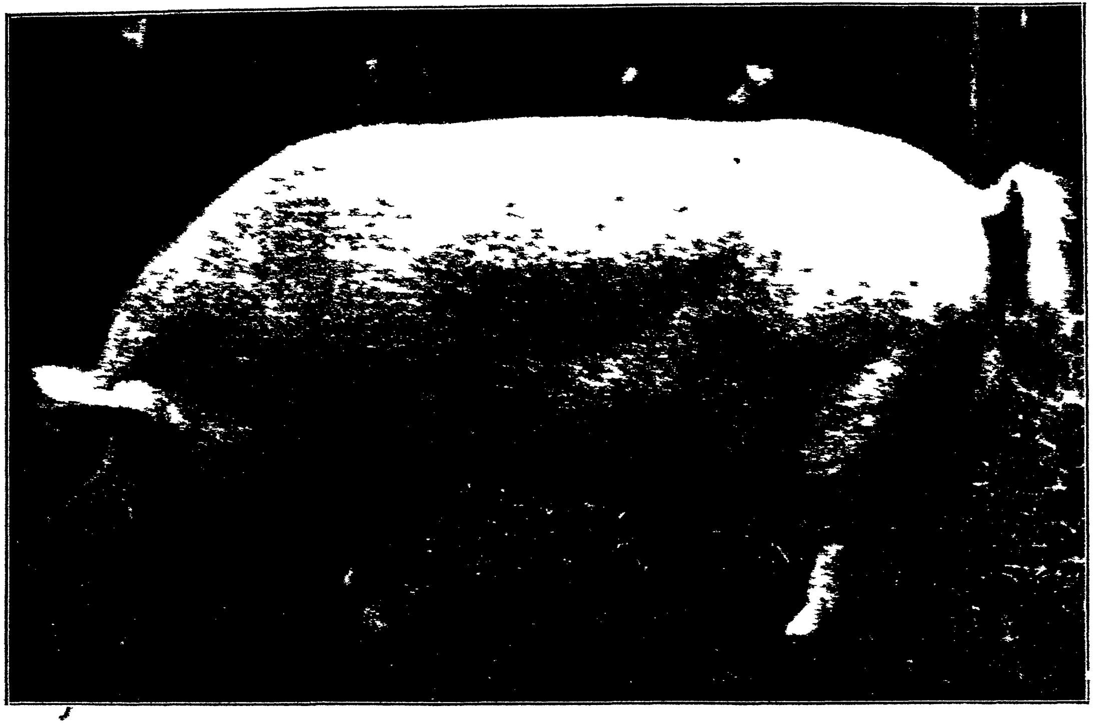
First Prize Royal Show, London, 1904
Exhibitors, The Proprietors of Cooper's Dip.

SHROPSHIRE SHEARLING RAM.



First Prize Royal Show, London 1904
Exhibitors, The Proprietors of Cooper's Dip

LARGE WHITE BOAR.



First Prize and Champion Gold Medal Royal Show London 1904
Exhibitor The Earl of Ellesmere

BERKSHIRE BOAR.

First Prize Royal Show, London 1904

Exhibitor, Sir Alexander Henderson Bart., M.P.

THE EXHIBITION.

Government Prizes

AGRICULTURAL AND INDUSTRIAL EXHIBITION.

The following are the awards of Government prizes for agricultural and industrial exhibits at the Cape Town Exhibition:

AGRICULTURAL IMPLEMENTS AND MACHINERY.

Judges: P. Ryan, Dr. E. A. Nobbs.)

Best plough or other implement suitable for dry cultivation: Diploma, Rud. Sack; Diploma, Hench Drumgold and Co.

Best steam engine suitable for agricultural purposes: First prize (£15), Govey and Co. (for Hornsby portable 16 h. p. steam engine with fire box suitable for coal, wood, or mest fuel).

Best oil engine suitable for agricultural purposes: First prize (£15), Govey and Co; second prize (£5), Cunningham and Gearing.

Best wind motors; First prize (£15,) Howard, Farrar, Robinson and Co.; second prize (£5), Stewarts and Lloyds (S.A.) Limited.

Best collection of fences and gates and appliances for making and mending the same, including jackal-proof, pig-proof, and temporary readily-removable fencing: Second prize (£5), Cyclone Gate Co.

The Judges remark as follows:

Best plough or other implement suitable for dry cultivation: There were three entries, none of which in the opinion of the judges covered the requirements as a dry cultivator consequently they could not award the prize, but in consideration of the excellence and variety of two of the exhibits, Rud. Sack and Hench, Drumgold and Co., your judges would recommend that each be awarded a diploma for excellence and variety.

Best oil engine for agricultural purposes: Five entries. In which were represented several oil engines of good workmanship, efficiency, economy and simplicity of construction, but as your judges had to confine themselves to the engine most suitable for general agricultural purposes, they had no difficulty in selecting the two portable oil engines exhibited by Messrs. Govey and Co. and Messrs. Cunningham and Gearing, to the first of which (Govey and Co.) they awarded the first prize, and the second to Messrs. Cunningham and Gearing.

Best wind motor: Three entries. But as one of the mills, Messrs. C H Dibb and Co.'s, had not arrived, the choice lay between the exhibits of Messrs. Stewarts and Lloyds, Limited, and Messrs. Howard, Farrar, Robinson and Co, both excellent and simple in construction. First prize awarded to Howard, Farrar, Robinson and Co. and second to Stewarts and Lloyds, Limited.

Best water motor and best animal motive power: There were no exhibits under these heads.

Complete equipment for tillage, harvesting, preparation of food and farm produce for farms, for each of the following classes; (a) Dairy farm, including poultry appliances; (c) fruit farm of 500 morgen. Two entries in section (a), both being good exhibits of cream separators, but as the exhibits did not come near filling the requirements for this class there was no award.

Best collection of fences and gates, and appliances for making and mending same, 8 yards of each fence to be shown, to include jackal-proof fencing and pig-proof fencing.

Temporary readily removable fencing: Two entries, only one of which, the Cyclone Gate Company, could claim to fill requirements of this class. Your judges regret that the most essential portion of this exhibit, the Jackal Proof Fencing, could not in their opinion be called jackal proof, and therefore could not award the first prize, but in view of the general excellence of the exhibit, including the ordinary fencing and pig proof fencing, together with the gates, their simple fastenings and the ingenious appliance for opening and closing any road gate, they awarded the second prize to the general exhibit.

Best steam engine for agricultural purposes: There was unfortunately only one entry, but as it entirely fulfilled the requirements, your judges awarded the first prize to Messrs. Govey and Co., for their Hornsby portable 16 h.p. steam engine with fire-box suitable for coal, wood or "mest" fuel.

Best collection of irrigation plant, representing complete outfit for irrigating 20 morgen of land, lifting water 15 feet, comprising pumps, engines, piping, flumes, sluice-gates, etc.: There were four entries for this class, and while amongst them they exhibited the necessary plant as specified above, yet in no single instance could the judges find on one stand a collection which might be considered adequate for the purpose. No prize could therefore be awarded. It is very much to be regretted that such was the case, as at the present time much interest is being manifested in agricultural circles in such outfits, and a proper exhibit would have had greater educative value.

Best electric engine suitable for agricultural purposes (judges: John Denham, M.I.E.E.; E. G. Gifford Jones, M.I.E E.): First prize, £15, South African General Electric Co. There were five competitors, and the judges remark: The South African General Electric Co. entered for competition, one direct coupled Secor oil engine and G.E. Co.'s dynamo for an output of 18 amperes and 125 volts, speed about 600 revolutions. This machine was started up quite easily in 10 seconds by the addition of a small quantity of petrol to the explosive mixture, after which ordinary paraffine is used. The firing was electrical, the power being supplied by Edison Lelands cells and an induction coil. The make and break contact, an essential feature, was of a most simple and substantial design and not at all likely to get out of order. The dynamo was of the well-know General Electric Co.'s make, and of the usual excellence of design. It will be understood that time and appliances were lacking for the purpose of testing efficiency of the various kinds of plant, therefore this point has been left out of consideration in making the award. We were chiefly influenced by the suitability of the exhibits "for agricultural purposes." In our opinion the exhibit of the South African General Electric Co. should be awarded the first prize, but in view of the lack of competition and interest taken we do not recommend that any second prize be awarded.

Best collection of commercial fertilisers (Judge, Dr. E. A. Nobbs): First prize, £10, Odams Limited; second prize, £5, Woodhead, Plant and Co.; diploma, White Ryan and Co. Messrs. Odams Limited made a very good and instructive exhibition of fertilisers in general use in the Colony, and are to be specially commended for the readily intelligible analyses supplied and the directions for use, which were concise and practical. A noteworthy omission from the stand was that of a sample of basic slag, a very common form in use everywhere. Messrs. Woodhead, Plant and Co.'s exhibit was also very satisfactory, and showed a varied assortment of the commercial fertilisers.

The exhibit by Messrs. White, Ryan and Co. was such a very good third that I would recommend some special recognition in the form of a certificate of merit or diploma be awarded. The analyses were occasionally less clear than they should be, phosphates being too vaguely described, while in certain cases of nitrogenous manure and potash salts, the purity in place of the composition was given. This is apt to cause serious misunderstanding. Instructions for use might with advantage, have been conspicuously shown, and so added to the instructive value of the stands. As compared with other agricultural exhibits, fertilisers have made a very close and good competition.

Best collection of agricultual foodstuffs (Judge, Dr. E. A. Nobbs). First prize, £10, Jas. Thorley, Ltd. Only one entry, but this so far as it went was quite satisfactory, and is deserving of the first prize. The judge remarks, however, that a collection of farm foods in Cape Colony is hardly complete without bone in some form or another

Best complete equipment for wine farm of 500 morgen (Judge, R. Dubois): There were no competitors.

COLONIAL MADE VEHICLES.

(Judges: D. Robertson, J. C. Holm).

Best Cape-cart, four-seated: First prize, £5. A. Gray; highly commended, Havenga and Dickson.

Best Cape-cart, two seated: First prize, £5. Havenga and Dickson; highly commended, King Bros.

Best farm wagon, without tent, unpainted: First prize, £5 King Bros

Best market gardener's wagon: First prize, £5, King Bros. The judges report that the workmanship was excellent in all classes, and made a very fine competition; and it was very difficult for them to decide the prize.

WOOL AND MOHAIR.

(Judges: Wm. Spilhaus, Alf. H. Oxenham).

Best 500 lb. grease wool, of Merino sheep, grown in the Karoo; First prize, £30, Geo. C. Jackson. Only one exhibit. The judges remark: We find this a very well-grown woll of good length, very strong in the fibre, of desirable fineness, and fairly even throughout. We consider that the sample is about as good a wool as we have seen from Karoo districts, and we have no hesitation, therefore, in recommending that the first prize should be awarded to it.

Best 500 lb. mixed veld, grass veld, or other than special Karoo grease; first prize, £30, Geo. King and Sons. Only one exhibit. The judges state that this is a mixed veld wool of excellent quality. The wool is particularly fine, of great strength and good length, and fairly even throughout. It is altogether a desirable wool, and although there is no competition, we recommend it should receive first prize.

Best 250lb. mohair, grown in the Karoo; First prize, £30 R. C. Holmes. This is the only mohair exhibited. The judges report that the sample is throughout of very good quality, very fine and silky,of good lustre, and of sufficient length for all practical purposes. They much regret that in this class also there should be no competition, but considering the excellence of the exhibit have no hesitation in recommending that it should receive the first prize.

CAPE WINES, BRANDY, ETC.

(Judge: Prof. P. D. Hahn).

(a) Open to Vine-growers Only.

Dry Red Wines.—Cabernet Sauvignon: First prize, £3 3s., Hy. Cloete, M.L.A. Only one exhibit. Very good in every respect. Hermitage; first prize £3 3s., C. Albrecht; first prize £3 3s., H. Cloete, M.L.A., first prize £3 3s., Louis Cloete. There were five entries. The above three were very superior exhibits and equal in quality; the judge therefore recommended that they should receive a first prize. Dry pontac: first prize, £3 3s., H. Cloete, M.L.A. Only one exhibit, but well deserves a first prize, being very sound and well prepared. Burgundy; First prize, £3 3s., C. Albrecht; second prize, £1 1s., H. Cloete, M.L.A.

Dry White Wines.—Sauvignon blanc: First prize, £3 3s., H. Cloete, M.L.A. Only one exhibit, of excellent quality. Hock: First prize, £3 3s., C. Albrecht; second prize £1 1s., H, Cloete, M.L.A. Sherry: Only one exhibit. No prize awarded.

Sweet wines: There were no exhibits.

Spirit.—Dop Brandy: First prize, £3 3s., James Malan. Only one exhibit, which when properly matured, will develop into a high class brandy. Cognac: There were no exhibits.

The judge remarks that the number of exhibits was remarkably small, and many classes were not represented; but the quality of the few exhibits somewhat made up for want of quantity. Dr. Hahn suggests that in future the prizes should be offered for the several kinds of wines, according to the grapes of which they are made. The farmer is expected to make a pure natural wine, and he knows his wines only by the name of the grape of which he prepared them. He should be encouraged to make such a pure, sound, natural wine of the grapes of his vineyard, and with this his labour ends; the mixing, blending, and further manipulation of the natural wines to obtain certain brands is the business of the wine merchant.

(*b*) *Open to Wine-merchants only.*

White wine of a Hock type: First prize £5, J. Sedgwick and Co. second prize, £2 10s., Western Wine and Brandy Co.

White wine of a Sherry type: First prize £5, J Sedgwick and Co.; second £2 10s., Paarl Wine and Brandy Co; third prize, £1, E. K. Green & Co.

Red wine of a Claret type: First prize, £5, J. Sedgwick & Co.; first prize, £5, E. K. Green and Co.; second prize, £2 10s, H. C. Collison, Ltd. There were six exhibits, which were all carefully prepared, and of excellent quality. The judge recommends two first prizes and one second.

Red wine of a Burgundy type. Frst prize, £5, H. C. Collison, Ltd.; first prize, £5, E. K. Green and Co.; second prize, £2 10s., J. Sedgwick and Co. There were six exhibits in this class also, and the award of two first prizes and one second is recommended.

Red wine of a Port type: First prize, £5, H. C. Collison, Ltd.; second prize, £2 10s., Paarl Wine and Brandy Co.; third prize, £1, E. K. Green & Co.; highly commended, Van Ryn Wine and Spirit Co. and J. Sedgwick and Co. All the exhibits are well prepared. but they were not all sufficiently matured.

Dry pontac: First prize, £5, H. C. Collison, Ltd.; second prize, £2 10s., E. K. Green and Co.

Sweet pontac: First prize, £5, Paarl Wine and Brandy Co.; second prize, £2 10s., E. K. Green and Co. There were six exhibits, which were sound and well prepared: that of the Paarl Wine and Brandy Co. particularly was an excellent representation of the good old type of sweet pontac.

Cognac (10 per cent. under proof, Sykes): First prize, £5, H. C. Collison, Ltd.; second prize, £2 10s., Paarl Wine and Brandy Co. Ltd.; highly commended, H. C. Collison, Ltd. There were eight exhibits, but four were respectively 15 per cent. 15·8 per cent. 13·1 per cent. 16·2 per cent. U.P., and were therefore excluded from competition.

Best assortment of Colonial liqueurs and cordials: First prize, £5, Western Wine and Brandy Co.; second prize, J. Sedgwick and Co.

The judge draws the attention of exhibitors to the conditions under which the prizes were offered. It will be seen that four out of eight exhibits of cognacs had to be excluded from competition owing to their being found to be under 10 per cent. U.P. Sykes; and one prize which had been provisionally awarded for wine had to be withdrawn, owing to its being found on analysis that salicylic acid had been used as a preservative in its manipulation. All exhibits to which prizes had provisionally been awarded were analysed before the final decision was made, and all dubious cases were tasted and judged a second time. Prof. Hahn suggests that wine merchants also should, whenever possible, exhibit their wines under the names of the grapes of which they are made If the wines are a blend, they might be exhibited as light white wines, light red wines, &c., in contradistinction to heavy and fortified wines.

OSTRICH FEATHERS.

(Judges: S. N. Ponder, P. G. van Breda).

Best 1 lb. primes: First prize, £5, A. E. Martin (Scianna and Co).

Best 1 lb. long black: First prize, £4, A. E. Martin (Scianna and Co).

Best 1 lb. feminas: First prize, £5, A. E. Martin, (Scianna and Co).

The judges remark: There was only one competitor. We consider the exhibit a fair sample of unwashed, well-grown feathers. No prize was awarded for long drab, as the exhibit was under weight; and there was no entry for white tails. No award was made for the best variety of 10 distinct kinds, as the exhibit was incomplete.

TOBACCO.

The judges (H. Becker and Wm. Drummond) report that after carefully examining the articles entered for competition they do not consider them worthy, and cannot award a prize.

COLONIAL FRUITS.

(Judges: Geo. Jeffreys and C. S. Ferguson).

Best assortment of preserved fruits: First prize, £3, "Disa;" second prize £1 10s., "Protea"

Best assortment of canned fruits suitable for export: No prize allotted, the exhibits are not considered suitable for export.

Best assortment of jams—The judges do not feel justified in awarding any first prize. Of the exhibits, that shown by "Protea" is the better, and the appearance of the jams is commended; but in consequence of one or two of the jars being leaky it is recommended for a second prize only (£10 10s.).

Best assortment of jellies: First prize £3, "Protea." No second prize has been awarded as the jellies shown by other exhibitors are not in jars of the prescribed pattern, some being in jelly moulds not properly closed.

"Disa" is the *nom de plume* of Miss Sophy Beyers.

"Protea" is that of Mrs. David Beyers.

DRIED FRUITS.

Raisins and prunes packed in boxes suitable for export; and peaches, apricots, apples, pears, and figs: there were no entries. Candied or crystallised fruits: there were no entries. Fruit trays, ladders, boxes, wood wool, and evaporators: there were no entries.

CHUTNEY.

There is no prize offered for this article, but we would strongly recommend an exhibit by Messrs. Shackleton, and Co., of Worcester, which is entered under No. 69 by Messrs. Dibb and Co. It is good chutney, and very neatly put up.

HONEY.

We are informed by tha secretary that there are several entries under this head, but that the exhibits have not yet arrived.

On the fruits and preseves generally we would express our regret at the absence of interest taken, there being practically no competition. More care should be taken by exhibitors to identify their productions by marking the section and number on each lot; owing to this not being done, we had considerable difficulty in classifying the exhibits. Jars of clear white glass and uniform size should be clearly labelled with name of contents. Some of the preserves exhibited would appear to be not of recent production, for the bottles bear labels so old and faded as to be scarcely legible. We think one of the conditions should be that any preserve competing should have been prepared within a specified time, say 12 months, in order to prevent the same exhibit being sent up for prizes in successive years.

JOINERY AND CABINET WORK

(Judges: A. G. Howard, S.A.,; W. R. Jaggard, A.R.I.B.A.; E. Schaufelberg.)

Best exhibit of joinery work, Colonial made of Colonial grown goods: First prize, £30, A. B. Reid and Co.; second prize, £15, W. and G. Scott.

Best exhibit of joinery work, Colonial made of imported woods: First prize, £30, A. B. Reid and Co.; second prize, £15, W. and G. Scott.

Best exhibit of cabinet work, Colonial made of Colonial-grown woods: First prize, £30, A. B. Reid and Co.

Best exhibit of cabinet work, Colonial made of imported woods: First prize, £20, Drew and Co.; second prize, £10, Salesian Institute.

POTTERY AND TERRA-COTTA WORK.

Best collection of Colonial-made pottery, including terra-cotta work, of Colonial clays: First prize, £10, Le Sueur and Co; special prize for terra-cotta work only, Church and McLoughlin.

Best collection of Colonial-manufactured artificial stone in paving slabs, tiles, pipes, channels and general cast work: First prize, £5, Salt River Artificial Stone Works. Special prize for ornamental cement tiles: Wagner and Rubenstein.

Best 1,000 bricks for building purposes. Commended, Koelenhof Brick Co., Stellenbosch; and Church and McLoughlin, Kimberley.

COLONIAL STONE.

There were no exhibits from Cape Colonial quarries.

The judges report generally as follows: The result of the invitation to compete, is, as a whole, disappointing. Competition is not as keen as we think it should have been, considering the repeated outcries about protection of Cape Colonial industries. In some cases only one exhibit was sent in. While this cannot be looked upon as competition, on the other hand, it would be manifestly unfair not to award a prize if a prize is warranted by the qualities of the exhibited article. We take into consideration that the competitor has submitted his exhibit in anticipation of keen competition. In joinery and cabinet work the competition has been much keener than in other classes of goods, which also come under our adjudication.

JOINERY WORK (Colonial made of Colonial-grown woods).

In this class there were three entries and three competitors. Careful examination showed that the work of Messrs. A. B. Reid and Co., is far superior to that of the other two firms who entered the competition under this heading. The selection of wood, the workmanship, and finish are as nearly as possible faultless. This firm entered the competition with four exhibits, namely : Door (stinkwood), wainscot (stinkwood), balusters and posts (various Colonial woods), fireplace (stinkwood). All these goods are excellently executed, and we decided that Messrs. A. B. Reid and Co. be awarded first prize under this heading. Messrs. W. and G. Scott also competed, with a staircase in stinkwood and yellowwood and a door in red and white Elswood. The door is not worthy of a special award as it is not above standard quality; but the staircase shows that good work can be done by this firm and a second prize is therefore awarded under this heading.

JOINERY WORK (Colonial made; Imported wood).

Under this heading there were only two entries, and two competitors, Messrs. A. B. Reid and Co. competed with the following articles: Balusters, wainscot (oak), door (oak), sash (teak), pair of doors (teak). All these are distinctly above the average quality, and some articles, especially oak wainscot and oak doors, are excellent. We decided to recommend Messrs. A. B. Reid and Co. for the first prize under this heading. Messrs. W. and G. Scott show window, with in and outside shutters in teak and bass wood, pair of entrance doors in walnut. Both these exhibits are well made, well finished, and are, as a whole, of standard quality. We decided to recommend Messrs. W. and G. Scott for the second prize under this heading.

CABINET WORK (Colonial Manufacture of Colonial Wood).

Only one firm competed under this heading, namely: Messrs. A. B. Reid and Co. This firm exhibits and competed with the following pieces of furniture: (1) Chest (stinkwood), (2) table (stinkwood), (3) chest (camphorwood), (4) stoep table (stinkwood), (5) carving (stinkwood), (6) four chairs (stinkwood), (7) two settees (stinkwood), (8) arm-chair (stinkwood), (10) table legs (stinkwood). All these articles, without a single exception, show most excellent qualities as regards selection of material, workmanship, and finish. Only first-class skilled labour is able to turn out cabinet work to such perfection. These articles prove strikingly that Colonial wood is, in appearance, far superior and in quality at least equal to any imported wood, and, secondly, they prove that skilled labour has been employed worthy of the material. Although there is only one firm competing under this heading, which would warrant the non-distribution of the prizes on the ground of insufficient competition, we strongly recommend that a prize equal to the first one for cabinet work made of Colonial wood in the Colony should be awarded to Messrs. A. B. Reid and Co., as we do not think that any firm could have submitted better work for competition.

Cabinet Work (Colonial Manufacture of Imported Woods).—Under this heading there were eight entries and five competitors. Messrs. Drew and Co. exhibit a mahogany show case This case shows distinct traces of very superior manufacture. Material, workmanship, and finish are first-class. We recommend on these grounds that Messrs Drew and Co. should be awarded first prize under this heading. The Salesian Institute submits an ornamental show case in teak. Workmanship and finish are well above the average, the carving is well and neatly done, and the whole shows that it was worked with skill and care. We recommend that the Salesian Institute should be awarded the second prize under this heading.

Best Collection of Colonial made Pottery, including Terra-Cotta work of Colonial Clays.—Messrs. Le Sueur are the only firm competing under this full heading. They exhibit a very good collection; amongst them very useful articles of fair quality, and some, such as garden edges, of very good quality. A fountain is the principal exhibit in connection with terra-cotta work. We recommend that Mr. Le Sueur be awarded the first prize under this heading. Church and McLoughlin, Kimberley, exhibit a collection of terra-cotta work of a very good description. The exhibit does not entirely comply with the above heading, as there is no pottery shown. As the terra-cotta is of such good quality, and so well finished, we recommended that Messrs. Church and McLoughlin should be awarded a special prize.

Best Collection of Colonial Manufactured Roofing Tiles.—There was only one exhibit under this head. The quality was not such as to qualify for a prize, so we cannot recommend that any be awarded.

Best Collection of Colonial Manufactured Artificial Stone in Paving Slabs, Tiles, Pipes, Channels, and General Cast Work.—There were two entries under this heading. Only the first named complied with the extensive conditions of the heading, and shows a distinctly good collection of artificial stone, tiles, steps, pipes and cast mouldings, posts, columns, caps, and ornamental cast work. The material is sand and cement of very good quality, and the goods are manufactured with care and skill. We therefore recommend the Salt River Artificial Stone Work to be awarded first prize under this heading. Messrs. Wagner and Rubenstein compete with a collection of floor and wall tiles under this heading. These tiles are made of cement and sand, and belong therefore to the artificial stone class. The tiles shown by Messrs. Wagner and Rubenstein are of the very best description; first class material is used, the patterns are well worked and finished, and the colours are even and pleasing. The tiles are manufactured with great care and skill. We recommend, therefore, that Messrs. Wagner and Rubenstein should be awarded a special prize for ornamental cement tiles.

Best 1,000 Bricks for Building Purposes and Face Bricks of Colonial Manufacture.—Competition under this heading was very poor. Eight competitors entered their names, only three competed, of which one was disqualified on the grounds that his goods were manufactured in Natal. We hold the view that under this heading there is not sufficient competition to warrant the issue of a prize. Better bricks might have been submitted from other firms. The two bricks shown are both of good quality; the Stellenbosch brick shows decided advantage over the Kimberley brick. The advantage of the Stellenbosch brick lies in the clay; the manufacturing might be improved. Both kinds are pressed bricks. The colour of the Stellenbosch article is deeper and richer than the Kimberley one. The one advantage of the Kimberley brick is its true shape. We recommend that both above-named competitors should be honourably mentioned.

Best Exhibit of Building Stone from Colonial Quarries.—There were several good samples of stone exhibited and entered for competition, but they happened to be quarried outside the boundaries of Cape Colony, and are therefore disqualified. It is to be regretted that no one in Cape Colony has had enterprise enough to compete for Colonial stone, as it is well known that good qualities of stone abound, especially in the Eastern Province. The present is an apportunity which may not occur for many years, and after what has been put forth in connection with Colonial industries, we cannot but animadvert on the seeming want of spirit on the part of Colonial stone merchants and others.

Colonial Clay.—As the due consideration of the merits of the exhibits under this head will be a lengthy matter, it will have to form the subject of a further communication.

METAL WORK.

(Judges: Professor H. Payne, Adn. Cunningham, and Geo. Smith, sen.)

Best exhibit of brasswork and ironwork, cast and wrought, of Colonial manufacture: First prize, £10, A. B. Reid and Co.

Best exhibit of sheet metal, tin, and zinc work, in Colonial manufacture: £10, for fire-resisting door, sheet tin work, A. H. Johnson and Co., Ltd.; second prize, £5 for ventilator, Chas. Cohen; highly commended, for cowls, H. Ochs; highly commended, for guttering, piping, ridging, and sheeting, Cutler and Marsden; special prize, for window lead work and glass, L. Furman. (Though the only entry of its kind, the judges consider this deserves special recognition for its merit.)

Best exhibit of Colonial-made machinery: Only one exhibitor has come forward, showing a variety of machines, and the judges consider that prizes should be awarded as follows: First prize, £10, for hydraulic feed diamond drill, Cunningham and Gearing; second prize, £5, for ammonia compressor, Cunningham and Gearing; highly commended, for orchard spraying hand pump, Cunningham and Gearing; highly commended, for deep-well pumping plant, boiler and engine combined, Cunningham and Gearing.

COLONIAL PRINTING AND BOOKBINDING.

(Judge: C. J. Fawcett.)

Letterpress binding: First prize, gold medal, Argus Printing and Publishing Co.; second prize, silver medal, Cape Times Ltd.

Stationery binding: First prize, gold medal, Cape Times Ltd.; second prize, silver medal, Whitehead, Morris and Co.

Letterpress printing: First prize, gold medal, Cape Times Ltd.; second prize, silver medal, Argus Printing and Publishing Co.

Lithographic printing: First prize, gold medal, Argus Printing and Publishing Co.

Process blocks: First prize, gold medal, Argus printing and Publishing Co.; second prize, silver medal, Cape Times Ltd.

Process printing: First prize, gold medal, Argus Printing and Publishing Co.; second prize, silver medal, Cape Times Ltd.

The judge reports generally as follows: In every case the specimens exhibited show considerable progress in the past five years, the workmanship being far in advance of any local productions that have come under my notice during that period. Owing to the scattered positions of the various exhibits and the incorrect list supplied by the Exhibition authorities, little opportunity was afforded for careful comparison, and, except in the case of Messrs. Whitehead, Morris & Co. and the Van de Sandt de Villiers Company, no specimens appear to have been specially submitted for competition. The only possible course therefore was to take the exhibits of each firm as a whole, and base my awards on the specimens of the best workmanship shown in each class. (*a* and *b*) The exhibit in these two classes are exceptionally fine specimens of first-class work, and compare very favourably with similar work produced in England. (*c*) Although there is little scope for competition in this class the specimens exhibited show a considerable advance in this work during the past five years. (*d*) The specimens shown by the Argus Company are very good, the others exhibiting no special merit, and not equal to similar work produced in Cape Town. (*e* and *f*) The only two exhibits in this class run each other very close, the Argus Company showing some very good half-tone work and the *Cape Times* an excellent line block. The work is altogether excellent, and I find it difficult to decide which is best, the award being given to the Argus Company for superior finish in blocks and printing.

BISCUITS AND CAKES.

(Judge: F Copeman)

Best assortment Colonial-made biscuits: First prize, diploma and £5, Attwell Baking Co., Ltd.

Best assorted Colonial-made cakes: First prize, diploma and £5, D. Dix and Son; second prize, diploma and £2 10s., Attwell Baking Co., Ltd.

The Attwell Baking Co. are also awarded a diploma for artistic piping of two-tier wedding cakes and savoy moulds, in respect to which the judge remarks that this particular section of their exhibit calls for special recognition, and the artistic merit of the work equals that displayed at London Exhibitions.

FLOUR AND MEAL.

(Judges: John H. Wood, J. F. Stadler.)

Best 200 lb. flour from South African wheat: Diploma, South African Milling Co., Ltd.

Best 200 lb. flour milled in the Colony: Diploma, J. P. de Villiers.

Best 200 lb. meal from South African wheat: Diploma, South African Milling Co., Ltd.

Best 200 lb. meal milled in the Colony: Diploma, E. J. Meyer.

The judges express their regret that there was very little competition.

CHEESE.

(Judge: James Woodin.)

No exhibits were sent in.

COLONIAL BLANKETS, ETC.

(Judge: John Ross.)

The judge reports that no exhibits of Colonial blankets are to be found.

Best exhibit of the home-spun mohair by spinning wheel: The judge reports that quality of the mohair is good—the thread is regular and evenly spun, and stands a strain of 5 lb. per thread. He regrets that for want of competition he is unable to make any award, but recommends the young lady spinner's good work to the favourable consideration of the Government.

NON-ALCOHOLIC WINE, LIQUEURS, AND CORDIALS.

(Judges: C. F. Juritz, M.A., St. C. O. Sinclair, M.A.)

Only one exhibit. No award.

COLONIAL MADE ÆRATED WATERS.

(Judges: C. F. Juritz, M.A., St. C. O. Sinclair, M.A.)

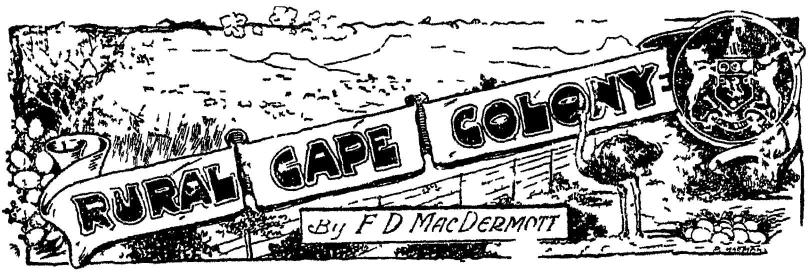
Diploma: Kops and Rawlings (S.A.), Ltd. Only one exhibit—containing 19 varieties. Judges report that many of these are rather insipid when rid of the carbonic acid, with which they are ærated; this does not, however, apply to the mineral waters, of which the Lithia water is undoubtedly the best. The quantities of salts contained in these mineral waters were determined, and in each case the characteristic mineral salts were present. Of the flavoured drinks, the American cream soda, kaola, Kops ale, Kops stout, and ginger ale were the best. We regret to note the increased tendency to employ artificial dyes for colouring beverages, such as these under consideration, many of the varieties exhibited being thus coloured, even, as in the case of lemon syrup, where there does not seem to be the slightest necessity for colouring the liquid a deep yellow. We do not consider the samples exhibited really excellent in quality; they are, however, fairly good as a class, while those specially mentioned may justly be termed good. As a Colonial industry, the variety of beverages shown calls for encouragement, and we think that, taking all the features into consideration, the ærated waters are deserving of the award provided for them, which we accordingly recommend, with the proviso that the wording of the diploma should not be such as to convey the idea that the exhibit is of unexceptional excellence; expressing at the same time the hope that any further development of the industry will not be along the lines to which we have felt bound to take exception.

HAY.

(Judge: Dr. E. A. Nobbs.)

Best bale Lucerne hay: Second prize, £3, R. Starke. There was only one entry, and the judge remarks that whilst the Lucerne itself was of excellent quality, it had been baled while somewhat fresh, and when examined proved to have heated; a second prize only was, therefore, awarded. There were no entries for oathay or grass hay, and lack of competition in this class of exhibit is regretted.

The awards in the remaining classes of exhibits, such as leather, Colonial paints, and clays, will be notified at an early date.



NO. X.

THE DISTRICT OF STUTTERHEIM.

Stutterheim is one of the most fortunately situated districts in the Eastern Province, and has been looked upon in times past as containing within itself enormous possibilities for development. But the iron hand of the continuous drought is causing the most sanguine to shake their heads, and give vent to doubts, which, a few years' back, would have been treated as something little short of sacrilege. The whole of the Eastern Province has suffered terribly from this last drought and Stutterheim has been no exception to the general rule. It usually escapes the extreme droughts because of its peculiar situation, but this one has been so severe and has lasted so long that not even the most favoured spots have been exempt from its rigours.

The advantages of situation claimed for the Stutterheim District are many owing to its physical contour. It lies at the foot of the Amatola Mountains on one side and is flanked on the other by the high ground towards Cathcart, while to the south it undulates towards the sea, impinging on the King William's Town District on a line close to Kei Road. As the whole district stands at an altitude of from 2,000 to 3,000 feet with the higher land behind, it comes within the influence of the coastal moisture and is usually blessed with rains averaging as high as 30in. per annum. But as these rains mostly fall in the summer and seldom come with sufficient regularity to assure certain crops, arable farming is too precarious to be relied upon.

Years ago when the settlers first moved into these parts some very fine cereal crops were raised from time to time, and the soil was considered so good that attempts have been made to plant settlers on small allotments for agricultural purposes. But owing to the varying conditions these attempts scarcely realised the anticipations of the promoters, though some of the men who took up land in that way have done very well on it since. The majority of the farms, which are not very large as a rule, are held on military tenure

“Bush Side,” Amebele, the property of Mr. W. R. Warren.

an indication of the disturbed conditions which prevailed when the lands were first given out, but it would surprise no one more than the owners of to-day if the terms of occupation were to be again enforced as they have been in times past. All these Frontiersmen are soldiers by instinct, and there are few of them who have not seen service of one kind or another, but it would come as a shock to many if they were called upon to supply men and horses, with rifles and ammunition, in discharge of the terms on which they hold their land. In fact, it seems that the original conditions of the grants have been dormant so long, thanks to the freedom from native troubles, as to lead to a general belief that their enforcement may never be expected again.

With the decline of agriculture owing to the irregularity of the seasons the district has tended more and more towards stock farming and as woolled sheep, cattle and horses thrive well it may now be fairly described as largely pastoral. In the more sheltered valley bottoms where water is available, crops are cultivated, of course, but they mostly consist of oathay for fodder, with mealies and potatoes in good seasons. When the rains serve, very large crops of mealies are raised, but the present season will see, it is feared, a great diminution in that product.

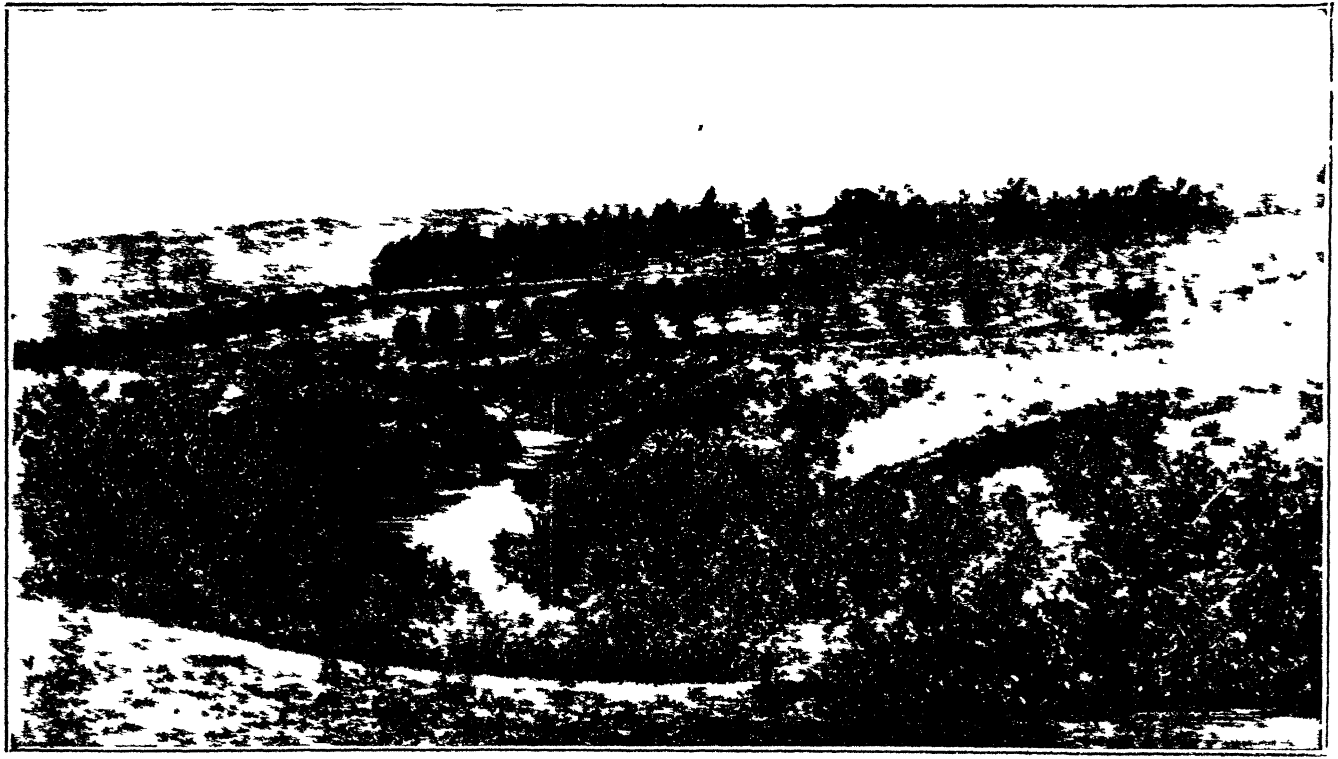
The soil is naturally fertile, especially in the valley bottoms where it consists largely of a dark friable loam owing to the presence in the past of a fair quantity of indigenous timber. Trees do well, and a good deal of planting has been carried on, mostly for shelter, by the majority of the farmers. Nothing like an organised attempt at afforestation has, however, been made, except in the case of some extensive wattle plantations which have done very well. On the higher ridges, the well known Government plantations at Fort Cunningham are a landmark for miles around and the success which has attended this experiment should encourage the farmers of the district to turn their spare energies in this direction. But forestry, even in the form of wattle plantations, appeals to very few owing to the length of time it takes to produce a crop, and, as many of the farmers argue, because of the uncertainty of the markets for forest products. There are fairly large indigenous forests in the neighbourhood worked under the supervision of the Forest Department and the average farmer feels that if he planted timber on a large scale he might some day have to enter into competition with these—a prospect he does not contemplate with any degree of satisfaction.

With cattle, and good woolled sheep, he feels fairly safe so long as the seasons do not press unduly hard upon him, for though wool and meat may fluctuate, there is always a market for them so long as the quality is fairly up to standard. The larger farmers, therefore, may all be described as pastoralists, while agriculture is left to the smaller men who are compelled by their circumstances to make the most of their holdings. The prime products of the district are first wool—and it is wool of an excellent quality taken all round; next comes meat, which the periodical stock sales held at Dohne, a station on the Eastern line of railway, show very distinctly, of late years at least, to be a profitable product.

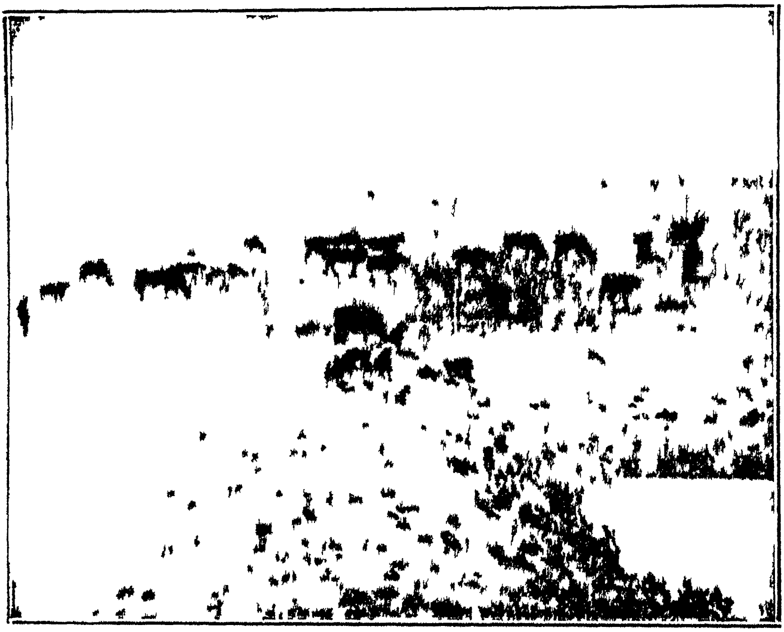
One advantage the farming community of the district has over many others is that of organisation. The Stutterheim Farmers' Association is a virile body, jealous of the rights and privileges of the people on the soil and one of the most active institutions of its kind in this country. Its headquarters are in the village of Stutterheim, a prettily situated little township about three miles from Dohne, and some four and a half from Kubusi Station. The village itself is quite a sanatorium, with a splendid water supply sufficient for household and irrigation purposes, a fact amply demonstrated by the wealth of foliage in the gardens, which flank all the streets and roadways.

THE KUBUSI RIVER.

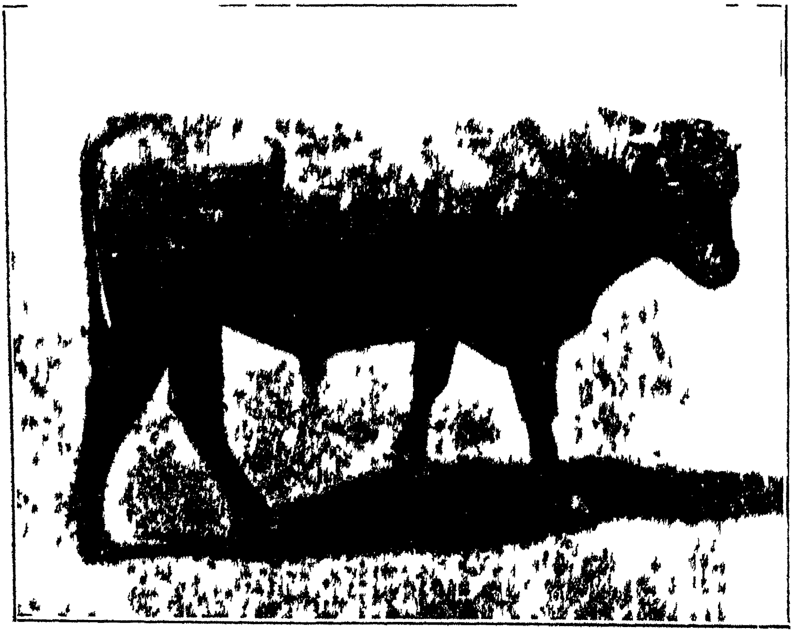
The great feature of the greater part of the Stutterheim District has always been its magnificent water supply, though the prolonged drought of past seasons has tested its capacity very seriously in that direction. The principal source is the Kubusi River, a perennial stream which flows almost from one end of the district to the other. It is not a large river, but flows with great constancy even in the worst of seasons, winding its way through the valleys for many miles until it joins the Great Kei not more than about fifty miles from the sea. As it flows through hilly country, for the greater part of its course, there are comparatively few spots where it can be utilised for irrigation on anything like a large scale. The waters can be, and are, led out in several places, but owing to the physical features of the country the amount of land brought under irrigation is not very large. .The river is so constant and the supply so large that a scheme to utilise it for the supply of the growing town of East London has been seriously considered, but for all that, with the exception of one well-handled attempt, which is described later on, very little effort seems to have been made, so far, to turn this valuable asset to account. The difficulties are apparent even to the casual observer, but a well directed and thoroughly organised scheme or schemes for turning this stream on to the thirsty lands that border its banks should not be beyond the strength and capacity of a progressive community like the farmers of Stutterheim. For the most part the river runs through deep valleys, unfortunately, and as a consequence, the furrows would either have to be so long as to raise the question of cost for serious discussion, or the amount of land brought under irrigation would be so little as to make the scheme prohibitive. But where the supply is so constant and the soil so promising there should be some justification for enquiry and investigation. If something could be done in this direction, at anything approaching a reasonable outlay, there could be little doubt as to its ultimate success, provided the irrigated lands were worked on sound economic lines, for the bulk of the ground affected lies within easy reach of railway communication. Most crops do well in these valleys, from tobacco and potatoes to cereals, with perhaps the exception of lucerne which does not seem to thrive over well all through the district—probably owing to the absence of lime. The prospects therefore of establishing



Mr. G W Turpin's Orchard on Waterford Estate, with glimpse of Kubusi river in foreground



Scene at Mr Turpin's Shorthorns



Mr Turpin's Imported Red Lincoln Shorthorn Bull on the Veld dairying on a large scale would be very good if a constant supply of succulent fodder were available from irrigated lands. And in such a district dairying should prove an exceedingly profitable adjunct to the present industries once it was fairly established. The natural grasses of the country are succulent—and it is all grass veld, hence the superior quality of the wool. The indigenous herbage might be supplemented by *Paspalum dilatatum,* which is thriving in patches on several farms thereabouts so that with care and forethought a very bright and prosperous future might be opened up to the farmers of these districts. As a start in this direction every farmer in this district should, at the first opportunity, put in some paspalum. It will thrive as a rule in any ordinary grass country, and once established soon justifies its existence by spreading even through the indigenous veld and improving it very considerably. It takes some trouble to get it well established and farmers must not deceive themselves with the idea that it can be sown broadcast over hard stony ground and left to live or die as it may. To make sure of a crop the ground has to be well prepared for the seed to germinate. Once a fairly large plot is established it can be planted out and soon begins to cover the ground.]

THE WATERFORD ESTATE.

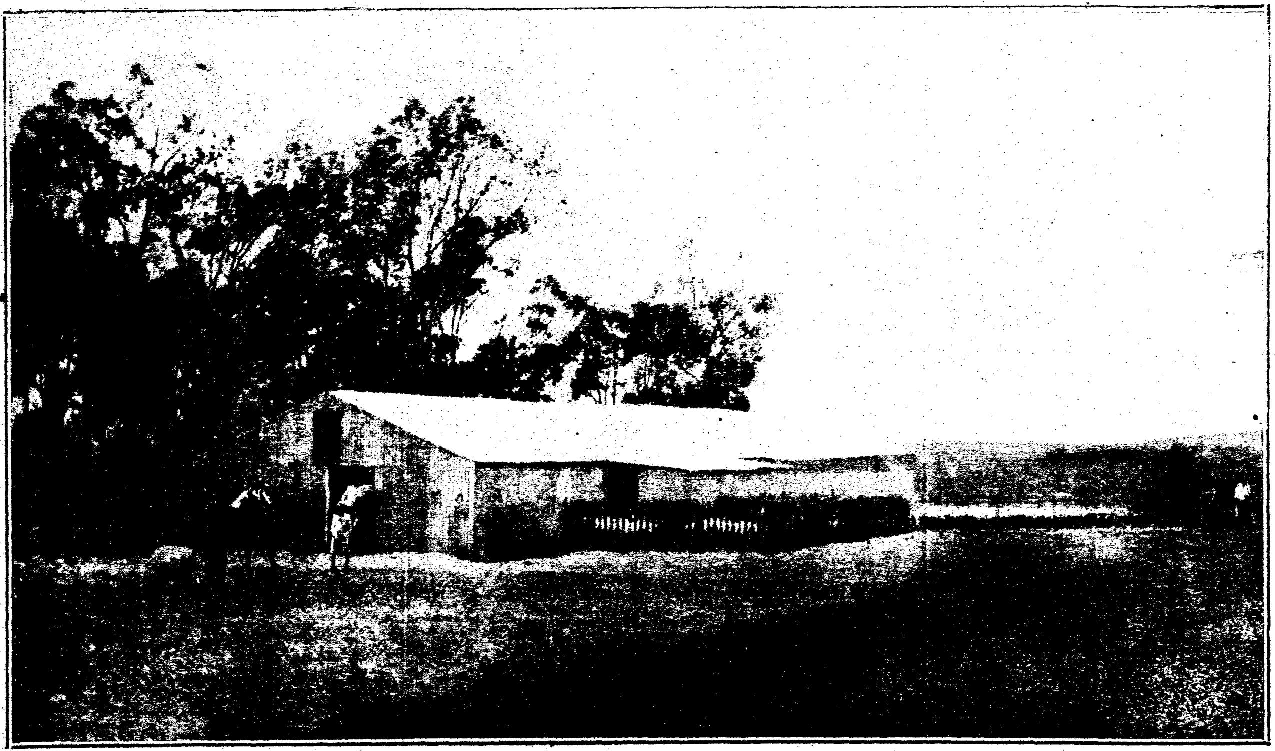
Although the Stutterheim District can boast of the main line of railway through the greater portion of it, and the close proximity of the branch line running to Komgha, and now being extended into the Transkei, it is not so easily visited if one desires to see its leading features from the cultural standpoint. In my case, not having too much time to spare, I left the rail at Amabele Junction and was fortunate enough to fall in with Mr. W. R. Warren, on whose farm "Bushside," the station is built. Mr. Warren is just outside the boundaries of the Stutterheim division, but as he hires a goodly extent of grazing for his sheep on the Waterford Estate, he is as good a Stutterheimer as the best of them. Mr. Warren was kind enough to drive me over to Waterford, after we had looked round "Bushside," and introduced me to what is probably one of the most important irrigation schemes ever attempted in the Colony by one man.

The Waterford Estate was originally, as I understand, secured by the late J. J. Irvine, a successful merchant of King William's Town, because of its immense natural advantages. It lies along the course of the Kubusi River, extending for some miles through that valley, and the excellent natural advantages have been fully appreciated. The estate covers a very large area, as may be gathered from the fact that six pastoralists are among the tenants, each with goodly holdings of arable and grazing lands. For many years past this property has been held up as an example to the whole of the Eastern Province and a model of what can be done by capital and energy, but if the accounts one hears as to the money spent upon it in times past are at all reliable, the results to-day seem scarcely commensurate with all the efforts put forth.

Interest centres largely about the complete and extensive irrigation work which has been done here. A furrow about seven feet wide in the main channel carrying from twelve to eighteen inches of water has been led out of the Kubusi above the railway station of that name, and traverses pretty well the whole of the estate being led back into the river close to the southern boundary near the property of Col. W. J. Warren, "Bleak House." This furrow is variously estimated at from ten to thirteen miles long and is said to have cost over £10,000. As reliable figures are difficult to obtain in the case of private enterprises of this description one has to fall back upon local traditions which are not always either accurate or dependable, but whether the amount is stated correctly or not it cannot be very far out when the magnitude of the work is considered. The construction of the furrow and the development of the estate seem to have gone hand in hand, for as the water became available so the area under cultivation seems to have extended. The original plans were evidently intended to make the water available for some form of permanent crops in order to supplement the natural herbage, but as the line of the furrow largely follows the course of the river the amount of land it serves is not so large as could be desired from so extensive a werk.

The greatest amount of cultivation is carried on in the immediate vicinity of the original homestead, where beautiful and extensive gardens are laid out, and thick belts of ornamental timber are planted. The furrow here is turned to good account, but further on the supply of water diminishes, largely, it is said, because of a servitude which was sold some years ago to a miller higher up. It seems a pity to see a really fine work of this description handicapped in this way, for there is little doubt as to the great service the full supply could render to the tenants on the lower portions of the Estate if they could avail themselves of it in its entirety. Since the death of Mr. J. J. Irvine, the original projector of the whole enterprise, the property has been in the hands of trustees whose duty it has been to nurse it for minor heirs, but the coming of age time is not far off now when great changes may be anticipated and a reversion to something like the old policy of progress may be hoped for. It is, undoubtedly, a noble heritage, and, properly managed, should yield a handsome return if only handled on liberal and far-seeing lines. The water supply alone is an asset that would be difficult to appraise, for it carries with it endless possibilities if the people who have the working of the estate could be encouraged to develop their industries on the most economic lines.

For the moment, however, most things in this district are at a standstill owing to the drought, and even on this magnificent property things are far from what they might be. As an instance, I may quote the case of Mr. G. W. Turpin, one of the tenants, a well-known breeder of shorthorn stock and a successful exhibitor at the local Shows. He has some excellent cattle, as the snapshots herewith show, but he had given up all idea of attempting to get them in show condition before the end of last year, and was then satisfied to be



The Shearing Shed Waterford Estate.

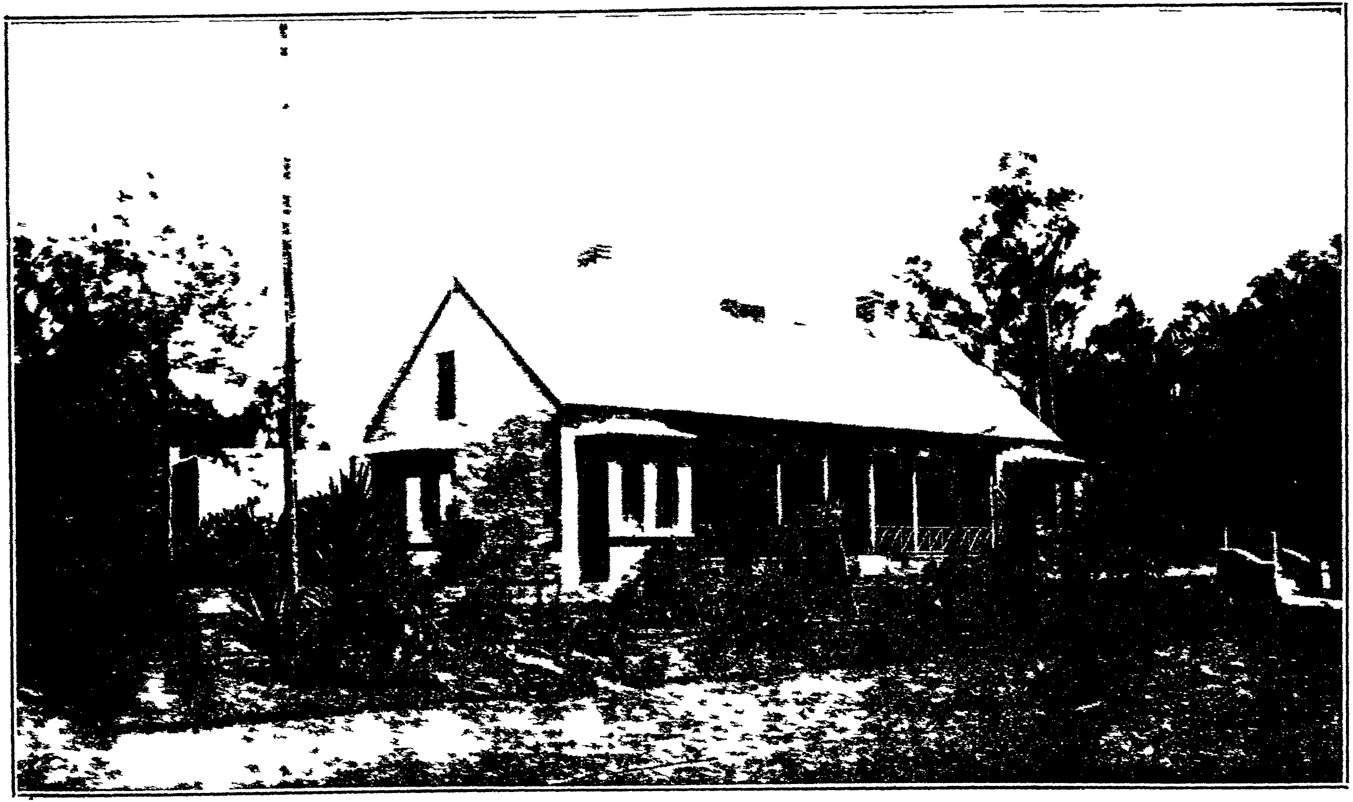
prepared to carry on with as little as possible owing to the great strain imposed by the drought. Mr. Turpin and his neighbours are not content to sit still and let things slide, but even the most energetic of men must at times bow to the decrees of Nature

A commendable degree of co-operation is shewn among the tenants of this Estate, and in many things they work together. The best indication of this is the shearing shed and pens they have put up for communal use—a view of which appears herewith. It is not a rival to the huge equipments provided on an Australian station, and the machine shear is still a thing of the future with them. But the pens are well constructed; there is a roomy sweating shed for the sheep and plenty of space for shearers, packers, &c., to work in

Interior of Shearing Shed, Waterford Estate showing Native Shearers at work

The native shearers, mostly full-blooded Kafirs, do the work very satisfactorily, and though they are slow compared with the skilled men who run machinery installations, they are comparatively cheap, and that is one point in their favour. The sheepmen of this district are careful in the handling of their wool, with the result that they, as a rule, command excellent prices. The fleeces are carefully graded and packed intelligently, the rough sorting meeting the demands of the East London buyers, who mostly purchase these clips. Some of them, however, are shipped direct to London, and their marks are well known and appreciated on the other side, while others again are bought by manufacturer's agents direct.

The capacity of the pasturage on this Estate may be gathered from the fact that the six tenants between them graze about 12,000 sheep, while the cattle vary from 500 in bad times to as high as 1,500 in good seasons. As an average as much as two sheep to the acre can



The Residence of the Irvine Family, Waterford Estate

View of the Kubusi Valley at Waterford, with the Fort Cunningham Plantations in the distance.

be carried the year round in ordinary seasons, while in good seasons three and four have been carried during the summer months.

One would have thought that dairying would have been a strong feature on a property like this, but, as a matter of fact, it is very limited. All the tenants do a little dairying, but with such excellent facilities for growing fodder, with a water supply that might be used for generating power, one would have thought the organisation of a creamery would have been a simple matter for the proprietors to have encouraged long ago. It is not always possible to make hay in these districts owing to the frequency of summer rains, but silos are not difficult to construct, and any quantity of stuff could be grown hereabouts for silage that would keep milking stock in condition through the worst of seasons. Lucerne has been tried, but what I saw would not encourage anyone to go on with it. A grass like *Paspalum dilatatum*, however, should be a success if planted with care, and with its noted drought resisting qualities would go a great way towards helping dairy cattle along. It may be that the sheep are looked upon as a sounder industry for these parts, and, as is well known, the grazing conditions that suit cattle do not suit sheep, so the farmers here are wise enough not to drop the substance to grasp at what to them may appear a shadow. But as dairying forms a staple section of their industries at present there is no reason why they should not make an attempt to extend it and set it on a sound and up-to-date basis. There should be a future in a district so well placed as this for a big business in sterilised milk for towns like East London and King William's Town, which are quite close to them, as well as the regular and assured markets they have for butter. Without knowing what the water power actually represents, one cannot estimate what might be done; but, on the face of it, if there is sufficient to drive a mill there should be enough to run a creamery and a refrigerating plant sufficiently large to handle all the dairy products within reach. If this power were turned to such a use it would be more profitable, and bring greater benefits to the district than are yielded at present by the milking. But these are matters for the future. For the next issue I have some notes about other parts of the district and more about the Kubusi and its natural advantages.

PAARL AGRICULTURAL SOCIETY.

The 1905 Show.

The Paarl Agricultural Society is advancing with sufficient rapidity to attract attention, for each successive show now can claim to be superior in many respects to those of the past. This year's, opened on the 19th ult., by His Excellency the Administrator, was certainly the best ever attempted by this Society and should the ratio of progress be maintained in the future, Paarl will soon be stepping into the front rank of district shows. Better buildings are wanted and more shade and shelter for stock—not to mention the visitors. The weather was fairly tolerable this year as the morning was dull and cloudy—a great blessing in the summer in these parts. The attendance was excellent and the C.M.R. band enlivened the proceedings. This is not a stock district, but it makes an excellent display in these lines, which improves year by year. The horses included Mr. Retief's well known pair, and some other good specimens for cart and carriage purposes, but the breeding classes did not fill over well. The cattle were a goodly section, particularly the Dutch classes, honours being secured here by a bull the property of Mr. J. Woodin, of Mariendahl, in the two to four year olds; while Mr. H. C. Gird won in the class over four. The Jerseys were also a good lot, but the best feature of the cattle lines was the goodly show of Colonial bred stock. The other stock does not call for special mention.

The fruit was good, considering the lateness of the season, particularly the Japanese plums, some of the newer varieties shown by the Rhodes Fruit Farms attracting a good deal of attention.

Vegetables were good, but size seemed to have more virtue than quality if one has to judge by the awards. The show of Agricultural Produce was fair, and still calls for improvement. The competition, considering how largely arable farming is followed in these districts, scarcely represents the importance of the industry. Attached is a list of the principal prize winners:—

PRIZE LIST.

BUTTER AND CHEESE.

Sample preserved or salted butter, 24 lb.; J A Briers, 1; J Hugo, 2; Miss G Cilliers. 3 Sample fresh butter, 5 lb., made up in pieces of 1 lb. each, in brick shape, without ornament or mark, bound in linen or paper: J A Briers, J Myburgh, 2; P J Hugo, 3

FRUIT.

Fruit for Export.—Five boxes fresh fruit, suitable for export, at least three kinds: M S Louw, 1: H O Arton, 2. Best and largest assortment fruit (collected): Toby Louw, 1 and 2.

GRAPES.—Collection grapes: E J Retief, 1; J P Goosen, 2. Four bunches Hanepoot grapes, white: J P Retief, 1. Four bunches Muscadel, white: J A Dreyer, 1; J P Retief, 2. Four bunches Muscadel, Red: D M le Roux, 1; J J le Roux, 2. Four bunches Hermitage: D M le Roux, 1; J J le Roux, 2. Four bunches French grapes: J P Retief, 1; J F du Toit, 2. Four bunches crystal grapes: A E Arnold 1. Four bunches green grapes: J J le Roux, 1; J P Retief, 2. Four bunches Pontac grapes: F J Joubert, 1; J J le Roux, 2. Four bunches any other kind: J F. du Toit, 1; J C le Roux, 2.

PEACHES.- Eight Peach Cape, freestone: C P Immelman, 1; J J le Roux, 2. Eight Clingstone: C J Uys, 1; J van der Spuy, 2. Eight Muir: R J Bulmer, 1 and 2. Eight Foster: R J Bulmer, 1; L Brown, 2. Eight New Hall: R J Bulmer, 2. Eight Mary's Choice: R J Bulmer, 2 Eight Elberta: H O Arton, 1. Eight Wit Palvie (cling): D van Velden, 1; B J Siebrit, 2. Collection peaches: D van Velden. 1; J J le Roux, 2.

APRICOTS.—Eight apricots, Blenheim. E J Woodhead, 1; J J Moll, 2. Eight Cape: A J Vercuil, 1 and 2

PLUMS.—Eight Japanese plums, Burbank. R J Bulmer, 1; M S Louw, 2. Eight Japanese plums, Kelsey; R J Bulmer, 1; H O Arton, 2. Eight Japanese plums, Shiro Smomo: L C Brown, 1; H O Arton, 2. Eight Japanese plums, Wickson: M S Louw, 1; R S Falcon, 2. Eight Japanese plums: H O Arton. 2.

CITRUS FRUIT. Eight oranges: R P Hugo, 1 and 2. Eight oranges, Villa Franca: H O rton, 1; J H T de Villiers, 2. Eight oranges, Lisbon; D van Velden, 1; F J Mayo, 2. Eight oranges, Genoa: J H T de Villiers, 1. Eight oranges, Cape: H Blignaut, 1; Mrs Theron, 2. Eight oranges, Portugal: J H T de Villiers, 1. Eight citrons: J P Hugo, 1; J P Retief, 2. Eight Pomelo: J P Hugo, 1.

FIGS.—Twelve figs, White Adriatic: Mrs J P de Villiers, 1; Twelve figs, Smyrna: J P Retief, 1.

Bunch bananas, Plantains: Mrs J D de Villiers, 1 and 2. Bunch bananas, J A Dreyer, 2.

Two water melons; J Theron, 1; H J van der Spuy, 2

Two musk melons: J J le Roux, 1.

PEARS.—Six pears Bon Chretien: R J Bulmer, 1; Groot Drak. Vineyard, 2 Six pears, Louise Bonne: H O Arton, 1; J H T de Villiers, 2. Six pears, Winter Nelis: F J Mayo, 1; H O Arton, 2. Six pears, Beurre Clairgeau; R J Bulmer, 1 and 2. Six pears, Kieffer: M S Louw, 1; H O Arton, 2. Six pears, Winter Saffran: H L de Waal, 1; J G le Roux, 2. Six pears, Kalabas: F J le Roux, 1; A J Vercuil, 2. Collection pears, named: J H de Villiers, 1; M Louw, 2.

APPLES.—Six apples, Reinette du Canada: P C Beyers, 1; R J Bulmer, 2. Six apples, Jonathan: Groot Drak. Vineyard, 1; H O Arton, 2. Six apples, Rome Beauty: R J Bulmer, 1. Six apples, Red Astrachan. H L de Waal, 1. Six apples, Hugo: F J le Roux, 2. Six apples, Wemmershoek: R J Bulmer, 1; P C Beyers, 2 Six apples, Achi: H L de Waal, 1; F J le Roux, 2. Six apples, Cleopatra: Myburgh, 1 and 2. Six apples, Versfeld's Warner's King: J H J de Villiers, 1; R J Bulmer, 2. Collection apples, named: J F Perold, 1; P C Beyers, 2.

Dish walnuts; J van der Spuy, 1.

Dish chestnuts: H Hesse, 1.

Dish strawberries: W Botha, 2.

Dish gooseberries, Cape: B J Seibrits, 1 and 2.

Dish mulberries: W Botha, 1.

DRIED FRUIT—25 lb. crystallised mebos: T van der Merwe, 1; P J P Cillie, 2. 25 lb prunes: R J Bulmer, 1 and 2 25 lb. mebos: W C van der Merwe, 1; W T van van der Merwe, 2. Five boxes apricots of 25 lb. each: R S Falcon, 1; E J Woodland, 2.

VEGETABLES.

Collection vegetables, quality and quantity combined, own products: Mrs. P. J. Retief, 1; D W de Villiers, 2. Collection vegetables, collected; D W de Villiers, 1; W Botha, 2. Collection muid potatoes, Early Rose, red or white: J P Retief and J Roos tied, 1 Muid potatoes, any other variety: D S Malan, 1. Muid onions: A J Vercuil, 1 and 2. Three cabbages: D W de Villiers, 1; E J Joubert, 2. Three pumpkins, early: J H de Villiers, 1; F J le Roux, 2. Three pumpkins, late: P de V Moll, 1; J W Arnold, 2. Three pumpkins, any other kind: J Hugo, 1, A S Brink, 2. Six vegetable marrows, long: J Heineman, 1; D W de Villiers, 2. Six vegetable marrows, custard: J Arnold, 1; D J Schneider, 2. Six cucumbers, green: D J Schneider, 1; C Ziervogel, 2. Six mangel wurzels: J Hugo, 1; D J Schneider, 2. Ten beetroots: P Briers, 1 and 2 Ten parsnips: A J Vercuil, 1 and 2. Ten carrots: J P Alant, 1; A J Louw, 2. Ten secrzoneras: S J van der Spuy, 1; D J Schneider, 2.

25 tomatoes: C Ziervogel, 1. Dish green beans: Mrs M J van der Spuy, 1; F J Joubert, 2. Twelve green mealies, for table use; Mrs J D de Villiers, 1; E J Retief, 2.

GRAIN.

Bag beard wheat (owner to possess at least 10 muids): T J Louw, 1; J P Cilliers, 2. Bag Du Toit wheat (owner to possess at least 10 muids): T J Louw, 2. Bag Rietti wheat (owner to possess at least 10 muids): C Briers, 1; M R H Briers, 2. Bag wheat, any other kind (owner to possess at least 10 muids): J P Cilliers, 1; Widow J D Cilliers, 2. Bag oats, any variety (owner to possess at least 10 muids): T J Louw, 1; A W Ekstein, 2. Bag barley, early beardless variety (owner to possess at least 10 muids): A W Ekstein, 1. Bag, any other variety (owner to possess at least 10 muids); J N Louw, 1. Bag rye (owner to possess at least 10 muids): H L de Wahl, 1; A W Ekstein, 2. Bag mealies (owner to possess at least 10 muids): J Louw, 1. 100 loose sheaves oats: W P Mostert, 1; D J J van der Spuy, 2. Two bales pressed hay, open to all residents in this division: L Fletcher, 1. Two bales pressed chaff, open to all residents in this division: Widow J D Cilliers, 1. Wagon load oat hay: W B Gray, 1; Widow J D Cilliers, 2. Collection dry beans, each kind to be not less than 25 lb: A J Vercuil, 1; H J van der Spuy, 2. Bag peas (dry): Myburgh Bros, 1. Exhibit meal and flour, local product: J P de Villiers, 1.

HORSES.

Pair Colonial carriage horses, not under 15 hands: J P Retief, 1. Pair imported carriage horses, not under 15 hands: J P Cilliers, 1. Pair Colonial cart horses, not under 14½ hands: J A Joubert, 1; S Joubert, 2. Pair imported draught horses, for heavy work, not under 15 hands: J N Louw, 1; W P Dreyer, 2. Colonial buggy horse, single harness, not under 14½ hands: F J Joubert, 1; H C Gird, 2. Imported buggy horse, single harness, not under 14½ hands: J P Cilliers, 1; M C Thom, 2. Colonial riding horse, not under 14½ hands: J Wahl, 1: F J Joubert, 2. Colonial or imported pony, single harness, up to 12 hands: A J Bester, 1; L Fechter, 2.

BREEDING HORSES.

Colonial stallion for breeding carriage horses, not under 15 hands: G J Joubert, 2. Imported stallion for breeding draught horses, not under 15 hands: D J Schneider, 1. Colonial brood mare: H P van Eyk; N B Gray, 2. Imported hackney mare, not under 15 hands: J A Briers, 1 Imported thoroughbred stallion, combining blood and power, H C Gird, 1. Imported thoroughbred mare, combining blood and power: H C Gird, 1. Colonial entire colt, bred in the Colony, two years old: J A Dreyer, 1 and 2. Colonial entire colt, two years, bred in this district: J P L Eckstein, 1; J D Beyers, 2. Colonial entire colt, one year, bred in this district: Myburgh Bros, 1; P A Briers, 2. Colonial filly, two years, bred in this district: W D du Toit, 1; H C Gird, 2. Colonial filly, one year, bred in this district: W D du Toit, 1; A W Ekstein, 2. Pair Colonial mules, inspanned: C Briers, 1; J A Dreyer, 2 Pair imported mules, inspanned: J D Joubert, 1; W P Mostert, 2. Span of eight Colonial mules: H P van Eyk, 1; H C Gird, 2. Span of eight imported mules: W P Mostert, 1; W P Dreyer, 2. Colonial jackass, for breeding purposes: A W Ekstein, 1 Imported jackass, for beeeding purposes, C Briers, 1. Colonial jenny, for breeding purposes: Myburgh Bros, 1.

CATTLE.

Colonial bull, Dutch, two to four years: J Woodin. 1; C W F Kohler, 2. Colonial bull, Dutch, four years and above, H C Gird, 1. Colonial bull, Alderney or Jersey, two to four years: C W F Kohler, 1; J P Hugo, 2. Colonial bull, Alderney or Jersey, four years and above: H Hesse, 1; G J Hugo, 2. Colonial bull, Afrikander, two to four years: C Lombard, 1. Colonial bull, any other kind, not above two years: Myburgh Bros, 1; W P Dreyer, 2. Colonial cow in milk, Dutch: J J de Villiers, 1; Starke Bros, 2. Colonial cow in milk, Alderney or Jersey: C W F Kohler, 1 and 2 Colonial cow in milk, Kerry: C J Uys, 1; J D Krige, 2. Colonial cow in milk, any other breed: Toby Louw, 1; W J Rassan, 2 Colonial cow not in milk, Dutch: Toby Louw, 1; Starke Bros, 2 Colonial cow not in milk, Alderney or Jersey: P J Hugo, 1; H P van Eyk, 2. Colonial cow not in milk, Kerry: L Fletcher, 1; Myburgh Bros, 2. Colonial two heifers, Dutch, up to three years: Myburgh Bros, 1; Toby Louw, 2. Colonial one heifer, Dutch, up to three years: H C Gird, 1;

Myburgh Bros, 2. Colonial two heifers, Alderney or Jersey, up to three years: J P. Hugo, 1. Colonial one heifer, Alderney or Jersey, up to three years: R D Koch, 1 J C Muller, 2. Colonial two heifers, Kerry, up to three years: F W Stegman, 1. Colonial one heifer, Kerry, up to three years: W P Dreyer, 1 Colonial two heifers, any other breed, up to three years: J Myburgh, 1; J Wiehahn, 2. Colonial one heifer, any other breed, up to three years: Myburgh Bros, 1; E J Retief, 2. Imported bull, Dutch, up to four years: A J Malan 1 and 2 Imported cow, Dutch: D J Schneider. 1; Myburgh Bros, 2. Two Afrikander oxen: P de V Moll, 1 and 2. Fattened ox: Toby Louw, 1 and 2. Five veld oxen: W P Dreyer, 1; Tregidga & Co, 2.

SHEEP AND GOATS.

Colonial Merino ram, pure bred: Myburgh Bros, 1; P A Briers, 2. Colonial three Merino ewes, pure bred: Myburgh Bros, 1 and 2 Colonial Cape bok ram pure bred: P Carstein, 1; H Heese, 2 Colonial three Cape ewes, pure bred J P Cilliers, 1 Colonial ram, for cross-breeding for heavy slaughtering purposes, white faced: J Myburgh, 1; C Briers 2 Colonial ram, for cross-breeding, for heavy slaughtering purposes, black faced: D J J v d Spuy, 1. Imported sheep (ram): J P Cilliers, 1. Colonial or imported Persian ram: D A Geldenhuys, 1; Myburgh Bros, 2. Colonial five Merino wethers: C Briers, 1 and 2 Colonial five Cape wethers: H C Gird, 1; M H Briers, 2 Colonial five cross bred wethers, any variety: Briers, 1 and 2. Colonial five Kapater goats: M R H Briers, 1 and 2. Colonial pet sheep; M R H Briers, 1 and 2. Colonial pet goat: A W Ekstein, 1; H A Blignaut, 2 Colonial five lambs, one kind, any breed: C W Briers, 1 and 2

PIGS.

Boar, Yorkshire: J R Louw, 1. Boar, Afrikander: J D Cilliers, 2. Sow, Afrikander: J D Krige, 1; G G Rossouw, 2. Pig fattened, any kind: Mrs H Beyers; J D Minaar, 2. Three pigs, any kind: J P Retief 1; H P van Eyk, 2. Three sucking pigs, not above six weeks: E J Horak, 1; N J Russow, 2

POULTRY.

Bronze turkeys: A Briers, Mrs P A Briers, 1 and 2. Turkeys, any variety: P de v Moll, 1; Toby Louw, 2. Embden or Toulouse goose: H Heese, 1. Geese, any other variety: P de Villiers, 1. Muscovy ducks, white: G Bernhardt, 1. Muscovy ducks, coloured: J C Muller, 1. Aylesbury ducks: H Heese, 1. Rouen ducks: W G de Villiers, 1. Pekin ducks: H Heese, 1. Any other variety, pure: H Heese, 2. Pair of ducks for table purposes: A J Joubert, 1 Pair of bastard ducks: A Clark, 1. Langshan: J Griffiths, 1. Buff Orpingtons: P A Myburgh, 1. Plymouth Rocks, any colour: L C Brown, 1. Buff Cochins: A Dreyer, 1. Cochins, any other colour: J W Arnold, 1. Houdans: Mrs H Heese, 1. Andalusians: Mrs H Heese, 1 Leghorns, white: J Griffiths, 1. Leghorns, brown: A Dreyer, 2. Minorcas: J Griffiths, 1. Wyandottes, silver: J Griffiths, 1. Wyandottes, any other variety: Mrs Heese. Bantam, any variety: J C Muller, 1. Breeding pen of cock and three hens, any pure white breed: A Dreyer, 1. Breeding pen of cock and three hens, any pure heavy breed: Mrs Heese. Pair of fowls for table purposes; Mrs P D de Villiers, 1. Cock, pure, for cross-breeding purposes: W S de Villiers, 1. Brood of six chickens, any pure breed, not older than three months: C Loubser, 1. Setting of 12 eggs, any pure breed. light: Mrs H Heese. Setting of 12 eggs, any pure breed, dark: Mrs Heese, 1. Pair of guinea fowls: G Nicholson, 1.

TRANSVAAL PLANT IMPORT REGULATIONS.

The following are the Regulations in force in the Transvaal in connection with the introduction, of plants, trees, tubers, bulbs etc:—

Regulations made under section 1 of Ordinance No. 16 of 1904 for preventing the introduction and spread of insect pests and plant diseases from places without the Transvaal, and providing for the control or eradication of insect pests and plant diseases within the Transvaal.

1. In these regulations the following terms shall have the meaning respectively assigned to them :

"Insect pest" shall mean any insect or other invertebrate animal which may be injurious to agricultural or horticultural products;

"Plant disease" shall mean any fungus, bacterial or other disease, which may be injurious to agricultural or horticultural products;

"Nursery" shall mean any land or premises whereon are grown or cultivated any fruit trees, plants or shrubs, intended for sale or disposal, and includes any piece of ground adjoining such land or premises and held by the same owner or occupier, on which is grown fruit trees, plants and shrubs, not intended for sale;

"Orchard" shall mean any land or premises whereon are grown or cultivated any fruit-bearing plants or trees, and includes any piece of ground adjoining such land or premises and held by the same owner or occupier, on which is grown fruit trees, plants and shrubs, not intended for sale:

'Plantation" shall mean any piece of land whereon are grown or cultivated any trees or vegetation other than an orchard or nursery.

2. No person shall introduce into this Colony any trees, plants, or portions thereof, such as cuttings, roots, tubers, bulbs, or fruit of any kind, except through the post or through certain Ports of Entry prescribed by the Commissioner of Lands.

No person shall introduce from oversea into this Colony any trees, plants, or portions thereof, such as cuttings, roots, tubers, bulbs, or fruit of any kind, except through the post and through the port of Cape Town and the port of Durban, or by special permission from the Commissioner of Lands through other ports.

3. (1) No person shall introduce from oversea into this Colony any of the following articles:—

(a) Grape vines or any portion thereof, with the exception of vines or portions thereof imported by the Commissioner of Lands under such precautionary measures as he may deem necessary;
(b) Coffee plants or any portions thereof, with the exception of *seed* free from pulp.
(c) Eucalyptus and coniferous plants, or any portion thereof, with the exception of *seed*;
(d) Stone fruit trees or any portion thereof (including seeds), that were grown or produced in any part of the United States of America, or the Dominion of Canada, or any other country to be from time to time notified in the *Gazette* as a country in which either of the diseases known as *Peach Yellows* or *Rosette* exists.

(2) From and after the first day of January, 1905, no person shall introduce into this Colony any peach stocks and peach stones from any country whatever.

4. No person shall introduce into this country from any part of South Africa any of the following articles:—

(a) Grape vines except those grown upon roots which are resistant to the attacks of the grape phylloxera (*Phylloxera vestatrix*);
(b) Apple stocks or trees, except those grown upon Northern Spy roots or other roots which are accepted by the Commissioner of Lands as being resistant to the attacks of Woolly Aphis (*Schizoneura lanigera*).

5. From and after the first day of January, 1905, no person shall import from oversea any trees or any portion thereof, with the exception of:—

(1) Fruit;
(2) Seed;
(3) Plum stocks, pear stocks, cherry stocks, for budding or grafting purposes;
(4) Blight-proof stocks and roots for apples:
(5) Citrus trees;

unless he shall have obtained the special permission of the Commissioner of Lands.

No such permission shall be granted for the introduction of more than ten trees or one hundred cuttings of any one variety, or for the introduction of more than an aggregate of one hundred trees or one thousand cuttings to any one party during one year.

6. From and after the first day of January, 1905, all shipments of fruit trees, fruit-bearing plants, or portions thereof, except seed or

fruit, entering the Transvaal from any part of South Africa, shall be accompanied by a certificate from the consignor, stating.—

(*a*) That the trees or portions thereof, and the premises upon which they are grown, have been inspected not over six months previous to the date of certificate by the Entomologist or other duly qualified Officer of the Department of Agriculture of the Colony or country in which the nursery is located, and no insect pests or plant diseases were found.

(*b*) That the plants or portions thereof have been fumigated with hydrocyanic acid gas in a chamber, and by a method of which the Entomologist or other duly qualified Officer of the Department of Agriculture of the Colony or country in which the trees were grown has approved.

(*c*) That when either grape vines or apple trees are included in the consignment, Section 4 of these Regulations has been complied with.

7. All trees, plants, or portions thereof, such as cuttings, roots tubers, bulbs, and fruit of all kinds, and their packages, cases, pots or other coverings, shall, before being delivered to the consignee, undergo an examination by an Inspector appointed for the purpose by the Commissioner of Lands, so as to determine, as far as possible, whether or not insect pests or plant diseases are present, and it shall be the duty of the consignee, or his duly appointed agent, to open the coverings and to afford every facility to the Inspector during such examination. If accompanied by a certificate as stated in Section 6, the Inspector may, in his discretion, dispense with such examination.

8. All trees and woody plants, cuttings, buds, or scions thereof, from oversea, together with their covering or packing material, shall, as a precautionary measure against the introduction of insect pests, be fumigated at the expense of the consignee in the manner prescribed by and to the satisfaction of the Inspector, and if the Inspector deems the treatment expedient, he may extend it to all other plants and all parts thereof.

9. If any article, in the examination provided for in Section 7, shall be actually found to be infected in whole or in part with any insect pest or plant disease, the introduction of which would be prejudicial to the interests of this Colony, it shall, together with all other articles in the same receptacle, together with all packing material, be cleansed or disinfected by the consignee, or at his expense, in the manner prescribed by and to the satisfaction of the Inspector, and if not so cleansed, or disinfected, or if any treatment at command shall be deemed by the Commissioner of Lands, or found by him to be insufficient for the absolute eradication of the insect pest or plant disease, or if the Commissioner of Lands knows the insect pest or plant disease to be of specially dangerous character, the article shall be destroyed without delay, no compensation being paid.

10. The inspection and other treatment of consignments imposed by these regulations shall, save as herein provided, take place on the premises provided by the Government for the purpose at the Port of Entry, but special arrangements may be made by the Commissioner of Lands for the execution of all the provisions of Sections 7, 8, and 9 on the premises of the consignee or other place, when approved facilities, inclusive of a proper fumigation chamber, are provided.

11. On the Inspector being satisfied with respect to a consignment that all the regulations and conditions herein set forth have been duly complied with, he shall issue a certificate to that effect to the consignee, and before the issue of such certificate the consignment shall be under his control for the purpose of these regulations.

12. Any article subject to examination under these Regulations which is introduced into the Colony by post may be intercepted and examined by an Inspector appointed for the purpose, and, if found infected with any insect pest or plant disease, shall be liable to be destroyed or may be cleansed at the direction of the Commissioner of Lands, and all expenses incurred under these Regulations may be recovered from the addressee, and the article may be detained until such expenses are paid by the addressee.

13. These regulations shall not apply to any consignment imported in bond for places beyond the borders of the Colony, nor to canned, dried, or otherwise preserved articles, in which there is no longer any plant life.

14. Every nursery in the Transvaal shall be registered by the owner or occupier thereof at the office of the Resident Magistrate in the District wherein the nursery is located on or before the 31st day of January in each year; and a registration fee of £1 per annum shall be paid by the owner or occupier of each nursery owned or occupied by him in such distrtict.

15. Every nursery shall be inspected at least once a year by an Inspector appointed by the Commissioner of Lands. Other inspections may be made if deemed necessary. It shall be lawful for an Inspector, duly appointed by the Commissioner of Lands, to enter upon any land and to do thereon such acts, matters, and things as are necessary or reasonably required for carrying out these Regulations, and any persons obstructing, resisting, or interfering with any such Inspector in the lawful execution of his duty, shall be deemed to have contravened these Regulations.

16. If the Inspector finds in any nursery, orchard or plantation, any insect pest or plant disease, he shall give the owner or occupier thereof a written notice that such insect pest or plant disease is present, together with recommendations for the eradication of the same. After the service of such notice no person shall remove, or cause to be removed, any plant or portion thereof from a nursery, orchard or plantation without the written permission of the Inspector. If the measures recommended have not been applied and the insect pest or plant disease destroyed at the end of a specified time after the notice was served, the Commissioner of Lands may order that no plants or portions thereof which are liable to disseminate the

insect pest or plant disease shall be removed from the orchard, nursery, or plantation.

17. During such period of restriction no person shall remove or cause to be removed from the nursery, orchard, or plantation, which is under restriction, any tree, plant, or portion thereof, which is designated by the Commissioner of Lands as liable to disseminate the insect pest or plant disease.

All restrictions placed upon a nursery, orchard, or plantation under Section 16 of these Regulatinns, shall remain in force until the Inspector shall, at a subsequent regular inspection, or at a special inspection, find the trees or plants in the nursery, orchard, or plantation, free from insect pest or plant disease, shall recommend to the Commissioner of Lands that a written certificate to that effect be given to the owner or occupier of the nursery, orchard or plantation concerned.

18. At each regular inspection the Inspector shall, if he does not find any insect pest or plant disease in the nursery inspected, recommend to the Commissioner of Lands that the owner or occupier be given a certificate to that effect. If at any special inspection the Inspector finds any insect pest or plant disease in the nursery the Commissioner of Lands may cancel the certificate.

It shall be unlawful for any person to sell or dispose of in any way any trees, plants, or portion, thereof, from a nursery, without having obtained this certificate.

19. Nothing in the preceding sections contained shall prevent the Commissioner of Lands from ordering and causing to be carried into effect the immediate destruction of any plants, trees, or portions thereof which are found infected by any insect pest or plant disease which is specially dangerous to the welfare of the agricultural or horticultural interests of this Colony.

20. The Commissioner of Lands may at his discretion order any owner or occupier of a nursery to fumigate all or any plants, trees, or portions thereof with hydrocyanic acid gas before they are allowed to be removed from the nursery. The fumigation chamber and method of fumigation shall be approved by a duly qualified officer appointed by the Commissioner of Lands. All packages or parcels, cases, or other receptacles containing plants, trees, or portions thereof, which are sold or delivered from the nursery in which fumigation has been ordered, shall bear a label stating that the contents have been fumigated in accordance with these regulations.

21. If the Inspector shall at any time find any trees, plants, or portions thereof, such as cuttings, fruit etc., exposed or offered for sale which are infected with any insect pest or plant disease, he may order such trees, plants or portions thereof, together with all other articles in the same receptacle, with all covering and packing material, to be cleansed or disinfected by the owner or his agent, or at his expense, in the manner prescribed by, and to the satisfaction of the Inspector, and if not so cleansed or disinfected, or if any treatment shall be deemed by the Commissioner of Lands to be insufficient for the absolute eradication of the insect or disease, or if the

Commissioner of Lands shall consider the insect pest or plant disease to be of a specially dangerous character he may order that the articles be immediately destroyed.

22. Any person who shall contravene any provisions of these Regulations shall be liable on conviction to a fine not exceeding fifty pounds, or in default of payment to imprisonment with or without hard labour, for a period not exceeding six months.

LOCUSTS IN THE COLONY.

The following reports on Locusts have been received by the Department of Agriculture :—

ALBERT.—C.C., December 10th, 1904:—Voetgangers appeared about two months ago. Farmers have been very energetic, spraying. At least 300 swarms destroyed. Veld or grazing has suffered and still is suffering severely from hundreds of swarms wandering about. Farmers who have hitherto saved their crops are in danger of losing them. Locusts not yet leaving, but it is hoped they will when their wings are grown.

ALIWAL NORTH.—C. C., December 13th, 1904, states Locusts are most prevalent in Wards 3 and 4 and have not yet spread much in other Wards. Farmers seem apathetic; but special J. P., Jamestown, says farmers are killing Locusts by burning, use of wet bags, Blue Mottled Soap (which is very efficacious when used 1 bar to 4 water), and that large flock (about 600) Great Locust Birds is following swarms and doing much havoc. Insects come from W. and N.W. and going S.E. probably reach flying stage in about a fortnight. Damage to Veld reported as considerable.

BRITSTOWN.—R M., December 14th, 1904, reports District practically free except Ward 4 "Karree Hoek." In other Wards all exterminated, either by drought or Bromn fly. Not much damage to veld as there was little to destroy, the few cereal crops existing and most of the gardens have been destroyed, but no damage to trees.

COLESBERG.—C. C., December 9th, 1904:—Large numbers appeared after rain. Farmers destroyed great number of swarms with dip and soap, great damage done to veld and about 80 per cent. of crops destroyed. Locusts leaving district and going Easterly.

BATHURST.—C. C. December 27th, 1904, reports Locusts came in considerable numbers from N.E did some damages in Cuylerville Ward but soon after the whole swarm died.

CRADOCK.—C. C., December 10th, 1904:—End October about 1 inch rain fell and within a week swarms of Voetgangers appeared (supposed to be from eggs deposited by flying swarms six or eight months ago). For first two or three weeks farmers were able to cope with them, numbers sprayed and others driven in a southerly directions. Later however very large swarms came from North (Middleburg, Steynsburg, Tarka, etc) and farmers stopped spraying. Veld cleared of every bit of grass. Not many crops to be injured. Lucerne did not suffer, locusts trekking through without touching a leaf. Small mealie crops destroyed, fruit trees stripped of leaves and in some cases of bark. Damage to veld enormous, but rain fell in some parts last week and there is promises of more.

District still over-run with Voetgangers. Swarms appear to be going South.

FORT BEAUFORT.—R.M., January 6th, 1905, forwards reports from Field Cornets who say that birds—not only Locust Birds, but small birds both fruit eating and other sorts—have practically cleared the distrist. Not many crops to damage and not much harm done. Veld damaged in some parts. Such Locusts as were not destroyed left in N.E. and N.W. directions—(Note· Witgat Spreeuws very active killing Locusts, also Finks etc.,)

FRASERBURG.—R.M., December 13th, 1904, states Locusts (Voetgangers) are present in large numbers in Ward 2—travelling N.W. to S.E. in direction of Beaufort West. Considerable damage caused to Veld, but does not think extensive damage done to crops.

HANOVER.—C. C., December 10th, 1904:—Most of the swarms that hatched in October have either died or disappeared suddenly —only ones left being at Carolus Port near De Aar. There were millions in Division, but farmers say only comparatively few found dead and cannot account for sudden disappearance of rest. Owing to want of rain, only grass or very young crops could be eaten and believed Locusts died of want of food. Many of crops are growing again and there was not much grass as it is "Karroo Veld."

KENHARDT.—C.C. December 12th, 1904:—Locusts hatched out in large numbers in E. S.E. and N.E. about middle of November, principal breeding grounds being tract of country from Rietfontein near Orange River to Prieska boundary. Locusts now moving East. Many have reached flying stage and will probably move across Orange River into S. Gordonia, as well as into Prieska. Farmers are apathetic, regarding all efforts as hopeless. Young grass that came up after October rains, eaten off, but dry grass left undisturbed. No crops in the country.

MIDDELBURG.—C. C. December 16th, 1904, reports that during October, after beautiful rains, Locusts hatched out in swarms especially in N.W. Have practically destroyed all standing crops. Potato crops eaten off. Damage general throughout district and veld denuded of the little grass that sprang up after October rains. Locusts chiefly moved S.E. and swarmed through Town in myriads, filling water furrows, countless millions drowned and took three and four days to cart away. Farmers indefatigable with sprays. Large number of large flies about. Locusts dying in enormous quantities in some parts—thinks it is of starvation.

MOLTENO.—R.M., December 16th, 1904, forwards report by Field Cornet Marais who states that the whole district is infested with Locusts in all stages, Voetgangers, Rooibaatjes, and flying Locusts. Voetgangers are slowly moving S. but district will be infested for some months yet. No early crops in the district to be damaged, but late oats, mealies, barley &c. were cleared off, and also most of the vegetable gardens. Veld destroyed everywhere, only hard sour grass left, and sheep and cattle getting poorer every day and suffering severely from drought. Finds blue mottled soap—1 bar to 5 gallons water—most destructive to Locusts. Swarms of a certain species of fly are about the Voetgangers and it is reported that the Locusts are dying from maggots or worms.

PRIESKA.—R.M., December 12th, 1904, states that after slight rainfall in October, swarms of Locusts appeared in different parts of the District. Locust Boards formed throughout District, but farmers very apathetic. Greater numbers of Voetgangers hatched out succumbed to great heat and strong winds combined with scarcity of food. No information received of any serious damage to crops and as veld is in poor condition through prolonged drought little damage has been reported.

STEYNSBURG.—C. C. December 13th, 1904, states he has consulted D.C. and others and that opinion is that almost all crops have been destroyed and veld seriously damaged. Locusts are not leaving but are spread in great numbers all over district.

TARKA.—R.M., January 9th, 1905, furnishes reports by Field Cornets—Locusts have been in district since October, but owing to drought not much damage done to veld. The crops suffered from flying Locusts severely in some parts, but in others the crops had either been reaped or were too poor owing to drought to suffer. Large numbers of Locusts were killed by the "Fly," and spray pumps were found of great use.

VICTORIA WEST.— C. C. December 13th, 1905, states damage done to crops by Locusts is very slight, and that owing to drought they are dying off in many parts. Still a great number left on one side of District, trekking in direction of Murraysburg District. (S.E.)

WODEHOUSE.—R M., December 12th, 1904, states Locusts are on Western border of District. Owing to entire absence of grass and crops very little damage done. Locusts appear to be only now entering District and to be taking Easterly direction—will be taking wing in about a fortnight.

QUEENSTOWN.—I. Leach, Poplar Grove Estate, December 5th, 1904:—Locusts devastating country to alarming extent. Has destroyed hundreds of swarms on his estate during last two months Had to reap one million bundles of wheat in green state to save straw for starving stock—veld as bare as public road.

C. C. January 5th, 1905, states Locusts have been ravaging district for last two months—in some parts they are now at "hopper stage" in others "winged." Crops owing to drought would have been scanty, but have been almost, if not entirely, destroyed and this applies equally to the veld. No sign of leaving the district. Winged ones generally move in W. or N.W. direction owing to E and S E winds prevailing, but others arrive with the wind.

Native Territories.

LIBODE.— R.M., December 9th, 1904, says there are Locusts in the bush veld, but none at present in open portions of district. They have not been able to do any damage, as there are no crops, and little grass owing to severe drought.

TABANKULU.—R.M., December 12th, 1904, says so far District has been free from Locusts—one swarm passing over, but no damage done.

TSOMO.—R.M., December 19th, 1904, states large swarms appeared in all parts of District about middle of November most numerous at first as Voetgangers in valley of Tsomo River and when fledged migrating inland. Numbers have greatly diminished owing to Locusts passing on to Nqwamakwe and Butterworth Districts Heavy storms of rain and hail about 7th December in N. part of District resulted in great destruction of Locusts. Natives are somewhat apathetic, but this greatly owing to there being little to lose through prolonged drought and consequent delay in ploughing and absence of veld. For these reasons not much damage done by Locusts.

COFIMVABA.—R.M., wires, December 31st, 1904, that Locusts have made their appearance and that necessity for their destruction has been explained to Chiefs and headmen at a meeting held on Dec. 10th, 1904.

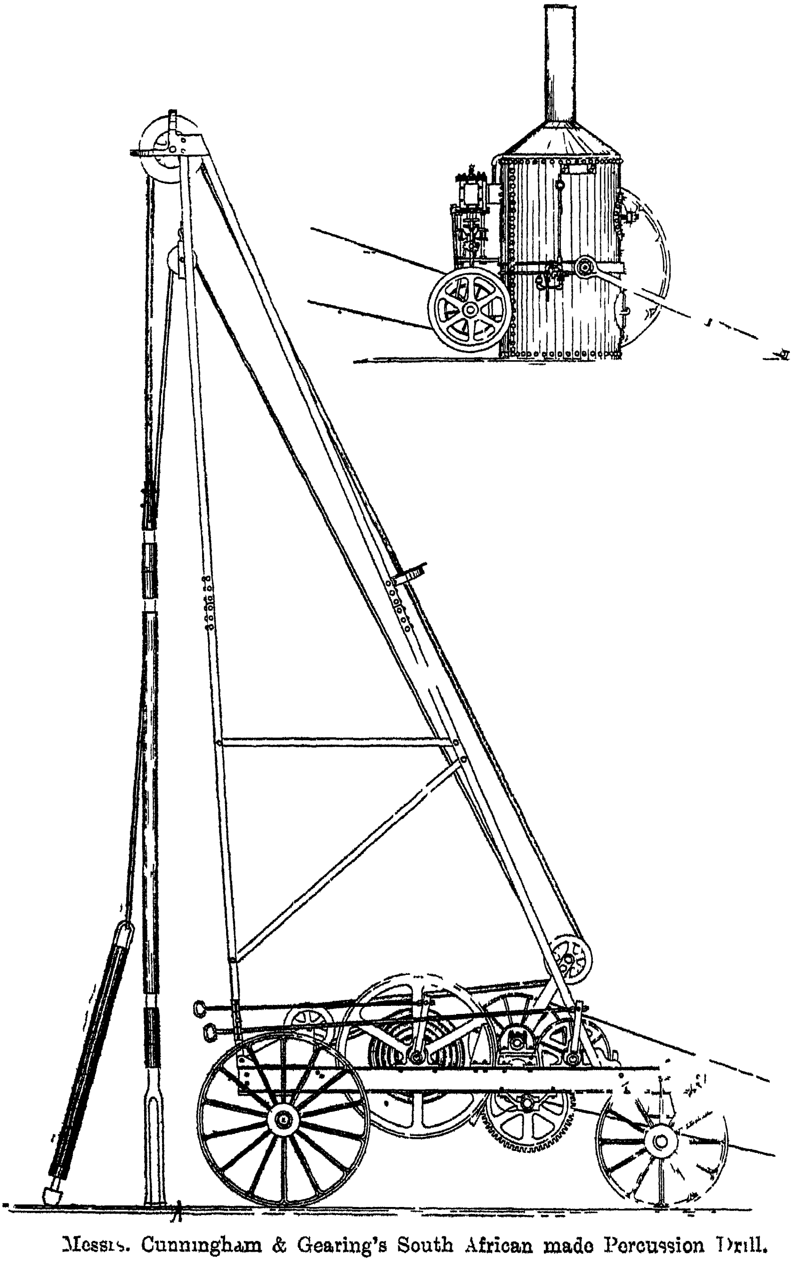
SOUTH AFRICAN MADE WATER DRILLS.

In response to our enquiries, arising out of the success which attended the boring on the Hon. W. Ross's farm at Biesjespoort, with a South African built drill, the makers, Messrs. Cunningham and Gearing of Cape Town, have forwarded to us details and particulars of this new percussion drill. Having been for many years the manufacturers of Water-boring Machinery to the Colonial Government, the late republics, and at the present moment to the Transvaal and Orange River Colonies, this firm have actual experience of the many and varied requirements of Water-boring plant for South Africa.

Their first drilling machines were placed on the market some years ago, and were of the now well-known portable diamond-drill type. Finding, however, that owing to the increasing cost of diamonds this form no longer compared with the percussion drill, their attention was directed to the construction of a machine which should be suitable for Colonial work. The machine now being constructed by this firm is the result of this experience, and includes every feature which by trial in actual work has been found successful.

In the first place the machine is constructed entirely of steel and iron. The frame is of girder-section steel, supported on steel wheels; the derrick is of steel angles, and is sufficiently light to be easily erected by the usual drilling staff. The machine is entirely controlled by means of two handles brought to the right front of the machine, and the drill operator can easily reach these handles while standing at the drill rope. The device for raising and lowering the tools consists of a cast-iron bull-wheel mounted on the cable drum, the outside face is arranged to be brought in contact with the friction pulley which is mounted on the first motion shaft to give the hoisting movement: while to the lower tools the bull-wheel is brought in contact with an internal brake shoe. Both these movements are controlled by the upper of the two handles on the front of machine, the lower one controlling the sand-reel drum in the same manner. For imparting the motion to the tools they have designed an entirely original and extremely effective spudding gear. This gear is arranged to give the tools an easy pick up and a quick drop, which is attained without shock or jar of any kind either to machine or rope, while by moving the control handle and releasing the bull-wheel from contact with the brake shoe, the spudding arm is put out of gear and the motion of the tools stopped.

The engine for operating the machine is a separate item, and is an enlarged edition of this firm's well-known portable type for diamond



Messrs. Cunningham & Gearing's South African made Percussion Drill.

drilling. The cylinder dimensions are 6in. by 6in. and the boiler has ample capacity for steaming the plant entirely on mest, or equally inferior fuel. For travelling, the boiler is arranged to turn horizontally, thus giving ample clearance between the lowest part of boiler and the road or veld. The advantages of having the engine and boiler a separate item are obvious. For instance, over rough country or through sluits, the machine would first be hauled across and the team returned for the engine and boiler, while on reaching good ground the whole plant can be taken on again. Further the engine is available for any other power purposes, such as operating pumps, chaff-cutters, &c.

This is the machine which has recently completed most successful work at the Hon. W Ross's farm, Highlands, Biesjespoort. At present it is boring for the Municipality of Beaufort West and is engaged on the drilling of a hole which will be taken to 400-500 feet depth. The hole is at present about 300 feet deep, and on this hole the machine has drilled as much as 126 feet in sixty-four hours, all rock drilling.

AGRICULTURAL SHOWS IN 1905.

Date Fixtures.

The following dates have been fixed for the Agricultural Shows in 1905:—

Sunday's River, at Bayville, February 8.
Robertson and Montagu, at Robertson, February 8.
Worcester, at Worcester, February 15.
Bredasdorp, at Bredasdorp, February 16.
Western Province, at Rosebank, February 22, 23 and 24.
Barkly East at Barkly East March 17.
Albany at Grahamstown, March 30 and 31.
Port Elizabeth, at Port Elizabeth, April 5, 6, and 7.
Bechuanaland, at Mafeking, April 12.

THE ORIGIN OF IGNEOUS DYKES AND THEIR RELATION TO THE UNDERGROUND WATER SUPPLY OF CAPE COLONY.

By Claude Warner, P. W. Department, Cradock.

Professor Archibald Geikie in his Text Book of Geology, Vol. 2, speaking of structural Geology says. "Every series of volcanic sheets poured out at the surface must have been connected with either fissures or orifices drilled through the terrestrial crust." That the masses of intrusive rock which we see at the surface in the form of Dolerite Dykes are the upward prolongation of one continuous body formerly in a liquid state we have abundant proof. In many regions of the earth, openings exist at the present day from which steam, hot vapours and streams of molten rock are thrown out from below as from some large reservoir, indicating a very high internal temperature. The temperature of the earth has nowhere been found to decrease as we descend. It always increases varying according to the conductivity of the rocks. The heat increases so rapidly that at a depth of 25 miles all known substances of the earth would become fluid, forming what is known as the magma.

At the Rose Bridge Colliery, Wigan, the deepest shaft yet sunk in England, the surface temperature averages 49° whereas at a depth of 2,445 feet it rises to 94° Fahrenheit.

The strata adjacent to the Dykes are often seen to have been disturbed by pressure, changed in colour and intensely hard; where it is in direct contact with the intrusive rock it shows signs of having been burnt and in some cases is quite changed in character *i.e.*, metamorphosed. The clay shales of the Karoo are altered many feet distant from the Dyke, becoming compact and crystalline Sandstone has in some localities been converted into quartzite, coal into anthracite and coke. We know then that the upheaval of even the most recent formations of Cape Colony accompanied by the intrusion of Dolerite took place long after the formations we now see at the surface were deposited. The eruptive Dolerite in many places may have cooled before it reached the surface and has now become exposed by the wearing away of the more recent and softer formations.

Now Dolerite is a crystalline rock containing about 50 per cent. of silica and is impervious to water; erupted in the form of a Dyke it frequently extends for many miles in one direction, forming an immense dam that effectually arrests any water that has percolated through the soil into the rock beneath. These Dykes are now so well known to influence the water supply that they are termed by many the "Water Klip" and water is erroneously thought to be in the Dolerite itself.

The fact that water is frequently seen to rise to the surface near the Dyke, and even through it, might at first give one this idea and boring has been continued at great expense after Dolerite has been reached, with no result. The water we see running through the Dolerite can only be an overflow through the cracks which are at the surface. To attempt to find water by drilling into any Igneous rock is similar to boring a hole in a masonry dam wall in order to pump the water from the dam. There are a few instances it is true where Dolerite has been penetrated and a softer formation encountered underneath; this is due to the Dolerite flowing horizontally between the lines of stratification of the adjacent rock and is found in the recent formations, as at Burghersdorp, Molteno and Indwe. These sheets of Dolerite are of no great thickness, they are frequently altered by contact with the adjacent strata, becoming decomposed into what resembles a friable sandstone, passing into a plastic clay. In fixing the site for boring we must 1st. ascertain from what direction will the greatest supply come; 2nd., Is the catchment area large enough,—taking into consideration the rainfall—to give us a constant supply? 3rd., Is there a dyke to prevent the water from running away to a lower level? 4th., In what direction does the stratified formation dip? 5th., Is there another cross dyke traversing the catchment area that will divert the water into another direction? In boring below a dyke, on the opposite side from the catchment, we can only expect to get the overflow, which in seasons of drought will become exhausted. With regard to the dip; the intrusive rock in forcing its way through the sedimentary strata has a tendency to throw it out of the horizontal and the dip will be away from the dyke. In this event we stand a much better chance of obtaining a a permanent supply by boring at some distance from the Dolerite in the direction of the line of dip; we shall have to bore deeper, according to the angle of the dip, but when water is struck it will rise to its natural level forced up by the head that is behind it. Moreover the strata being softer at a distance from the dyke, it is capable of holding more water. In the case of a porous sandstone the water may be held in suspension as if in a sponge, when penetrated by the drill it will flow at once into the borehole as the line of least resistance.

If the sandstone is covered by a formation such as the red clay-shale of the Karoo which is impervious to water a capping is formed which effectually keeps the water down though there may be a considerable pressure behind it. A mistake is often made in putting down a borehole on the top of the spring or where the surface is seen to be moist. The water which we see at the surface may have travelled a long distance through subsoil before it becomes visible and is perhaps an overflow from some dyke. A shallow hand-dug well would in this case be more useful than a borehole. A man who has the power of locating water with a divining rod will often go wrong here, and do more harm than good by sinking a borehole below a natural spring instead of above it. The height of the spring will be reduced, flowing away through the new outlet underground. At the present time I do not think there is a Division in Cape Colony that has not its water diviner. One might almost say that each ward has its expert. Some of them have met with a certain degree of success, unfortunately their failures for obvious reasons are not heard of. Time after time during my travels of inspection of boreholes put down by Government foremen and by contractors I have come across instances where money has been paid by farmers to the so called Water Diviner and no water found. Places have been selected for boring that anyone who has the slightest knowledge of the formation of rocks could tell at once that no water could possibly remain in the situations chosen, even if it could get there. With some men who are supposed to have the faculty, I am convinced that the willow stick or what over medium they employ works even better with them on Dolerite than it does with water, Dolerite having been encountered within a few feet of the surface, at sites they have selected and no water found. Other cases have been brought to my notice where an inexhaustible supply of water has been obtained where the stick would not work. With some people it has been proved that the stick will work almost anywhere; even a slight moisture in the rock is sufficient to act as a conductor. And again many people are affected electrically by iron, gold and silver.

With reference to the source of our supply. A very large proportion of the rainfall must be lost by evaporation but undoubtedly the greater part runs to waste down the sluits and rivers in flood to the sea; carrying with it some thousands of tons of valuable soil. What was at one time flat table land is now undulating country devoid of forests or vegetation; the tendency is for the mountain sides to get steeper, increasing the rapidity of the rivers which carry destruction in their course. When we come to think that every inch of rainfall represents on a square mile 14½ million gallons of water, instead of pursuing a course antagonistic to nature, ought we not rather come to her aid by preventing the formation of sluits; assisting the rain to penetrate the soil by keeping the ground cool and damp with the aid of grass and trees instead of leaving it bare to be scorched by sun and wind; by controlling the rivers and bringing new lands under cultivation, stop the immense quantity of silt brought down, thus heightening the level of the ground by forming new deposits? As the population of the land increases and the introduction of plants and animals only useful to himself, so will the ill effects of man on the geological features of the country become more and more pronounced. And we shall, when it is too late, wake up to the fact that our boreholes are running dry with no prospect of the rain penetrating the earth to replenish them.

Outbreaks of Infectious Disease in December, 1904.

Return shewing the number of Outbreaks of Scheduled Diseases reported to the Department of Agriculture during the Five Weeks ended 31st December, 1904.

DISTRICT	Anthrax (Meltziekte).	Epizootic Lymphangitis.	Glanders.	Lung-sickness, Pleuro-Pneumonia)	Redwater.	Scabies (Equine).	Sponsziekte (Quarter Evil).	Tuberculosis.	Total Number of Outbreaks.
Albany	...	...	2	...	1	1	...	...	4
Albert	...	...	1	...	...	.	...	...	1
Cape	...	...	5	...	...	1	...	...	6
Durbanville ...	...	..	...	...	...	1	...	..	1
East London ...	...	...	2	1	...	...	3	...	6
Fort Beaufort ...	...	...	...	...	...	2	..	...	2
Herbert	2	...	...	...	..	...	...	...	2
Kimberley ...	2	...	...	...	..	1	...	..	3.
King William's Town	...	...	...	2	...	...	...	...	2
Knysna	...	...	1	..	...	...	...	...	1
Ladismith ...	...	...	...	...	1	...	...	...	1
Mafeking	...	...	...	...	...	1	...	...	1
Malmesbury ...	...	1	...	..	.	...	...	...	1
Montagu	...	...	1	...	...	...	...	...	1
Oudtshoorn ...	...	...	...	...	1	...	...	.	1
Piquetberg ...	...	...	1	...	...	...	...	...	1
Riversdale ...	...	...	...	...	2	...	...	...	2
Somerset East ...	...	...	...	...	...	...	1	..	1
Stellenbosch ...	...	...	1	...	...	1	...	...	2
Taung	...	...	...	1	...	...	.	...	1
Uitenhage ...	...	...	3	...	2	...	..	.	5
Victoria East ...	...	...	...	...	2	...	...	...	2
Vryburg	...		...	...	...	1	...	...	1
Wynberg	...	...	..	...	...	1	...	..	1
Native Territories:									
Kentani	...	...	...	2	...	...	...	...	2
Nqamakwe ...	1	...	...	...	...	...	...	...	1
Bizana	...	...	...	...	...	1	...	...	1
Kokstad	...	...	...	...	..	...	...	1	1
Matatiele	...	...	...	1	4	...	...	...	5
Totals for December ...	5	1	17	7	13	11	4	1	59
Totals for November...	5	3	11	10	5	7	4	...	45

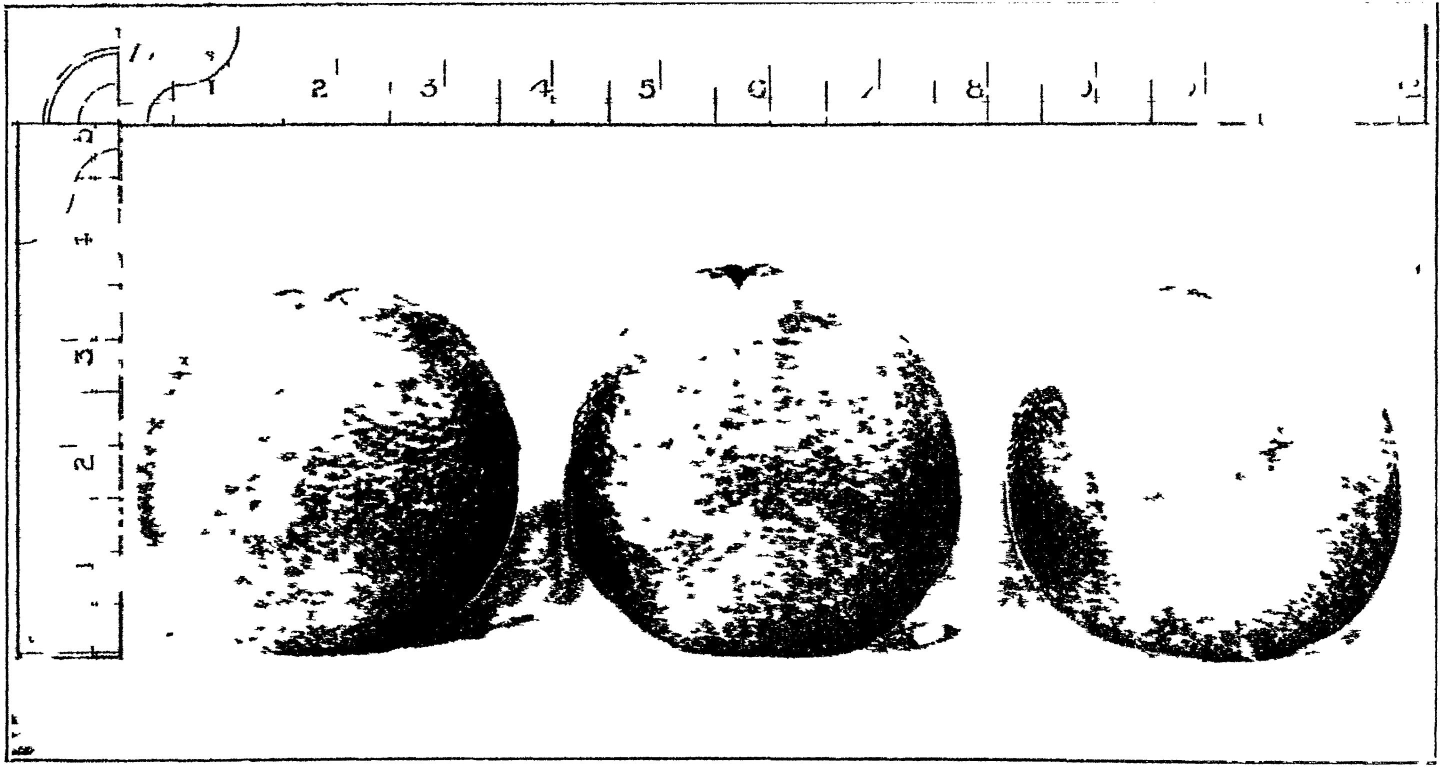
A LATE CAPE ORANGE.

Those of our readers who take an interest in these things will recollect the attention we directed last year to the line taken by Mr. Henry Meyers, the well-known citrus grower of Simondium, Paarl, with regard to South African varieties. Mr. Meyers then asked for information from growers possessing old-established groves as to any peculiar advantages they might claim to possess, and it is pleasing to learn that he has met with a success in this direction that promises to be full of importance in the future.

Mr. M. J. B. Langfield, of Stonedale, Tylden, sent Mr. Meyers some particulars about some trees on his farm, which at once drew the latter's attention. On enquiry, he found that Mr. Langfield had a small grove of orange trees which, while possessing all the characteristics of the imported late bearers of the best varieties, produced fruits far larger than any of them, and, at the same time, of excellent flavour and appearance.

These trees, it seems, were on the farm Stonedale when Mr. Langfield bought it, and are estimated to be from 30 to 40 years old. The fruits begin to colour as early as July, but they ripen so slowly that they hang on the trees until December and January. The three shown in the illustration herewith were taken from a sample lot of fifteen sent down by Mr. Langfield. They were photographed at the end of December, and were only just ripe then. The skin was rather thick, but otherwise they were excellent eating, the flavour being everything that could be wished. The size of these fruits can be estimated by the inch rule photographed along with them. The exact measurements around and lengthwise of the left hand and middle ones was 11½ in. x 11 in., taken with a tape. The right hand fruit measured 11 inches each way. Mr. Meyers has named it the "Stonedale Late."

They are a larger orange than the Valencia Late, and have the same range of season, so that the steps which Mr. Meyers is taking to propagate them on a large scale should meet with its own appreciation.



Samples of 'Stonedale Late' Oranges, photographed with inch rule to show the size

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

A Working System of Locust Destruction.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—With reference to the vital question of the destruction of Locusts, it must appear to any careful inquirer that the present method, as recommended by Government, is a very imperfect one.

The question is, can a better method, easier and more efficient, be discovered than spraying the locusts with soapy water, which, I observe, has been condemned by the Molteno Fruit Growers' Association as unsuccessful?

May I draw the attention of this Association, and all who are concerned in the prosperity of the country, to a system of Locust destruction, which I have lately seen working most succesfully on the farm of Mr. Henry Meintjes, Boomplaats, O.R.C., in the hope that the Government of this Colony may alter their plan of campaign against the locusts?

Mr. Meintjes's *modus operandi* is as follows:—

Zinc sheeting—18 inches wide and in as long lengths as possible—is fixed to the wall or fence surrounding the "lands," care being taken to sink the sheeting about three inches into the ground. The lengths of this sheeting are joined by staples.

Care is also taken: (*a*) that the angle the sheeting forms with the ground is either a right angle or an acute, but by no means an obtuse angle that the locusts can easily assail: (*b*) that the sheeting is put up strongly enough to resist the wind; (*c*) that at intervals of about forty yards tin cases are sunk, until the tops of them are level with the ground, while the sides are hard up against the sheeting running along the wall or fence; wings of the sheeting are also being made to lead up to the tins, as per diagram.

This completes the arrangements, and lands thus protected are absolutely safe from attacks of hopping locusts.

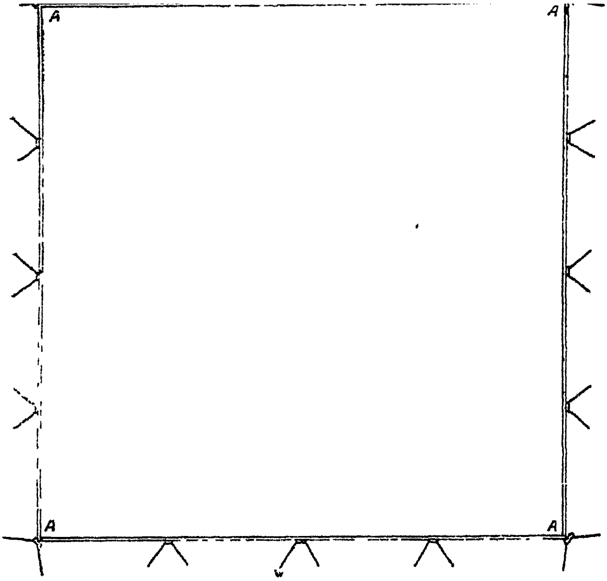
Instead of tin cases, holes 5 feet by 3 feet having the edges covered with zinc sheeting, answer very well, but the Army biscuit box is as good as anything.

The farmer thus "armed and well prepared" never struggles to drive locusts away from his "lands," but encourages them to go there, knowing that very soon they will be converted into "tinned stuff."

At any time should it be desirable to empty the holes of locusts, it may easily be done by ladling with paraffine tins with handles attached to them. The locusts thus collected in the holes, are deposited into pits which when full are closed up with earth.

In the very early stage when the locusts are about the size of the household fly, Mr. Meintjes has found that one biscuit tin would entirely hold a fairly large swarm.

I happen to have been travelling round the farms of part of the O.R.C. quite recently, and only on this one farm have I seen a working system for the *extermination*



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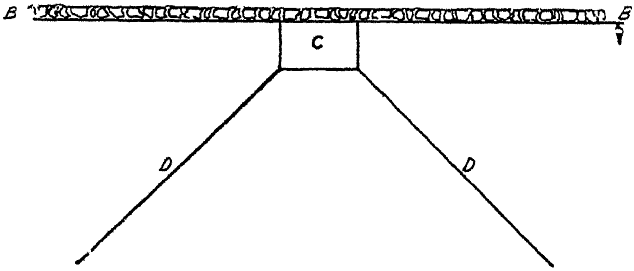

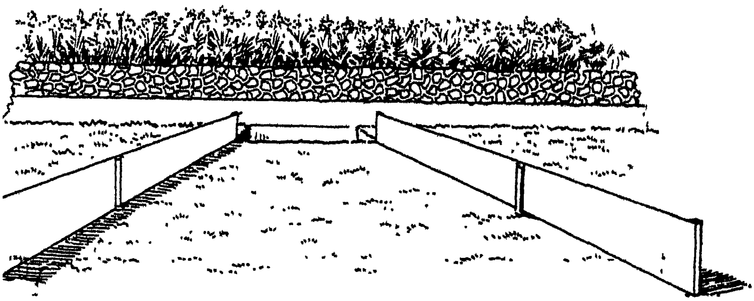

No. 1.—Diagram of Protected Lands,

shewing Lands enclosed by Zinc-sheeting-lined Walls, having Locust Pits every 40 yards, from which extend wings of Sheeting, forming Leads.

No. 2—Sectional Diagram

of portion of Zinc-lined Wall, showing Locust Pit and Wings. B—Wall lined with Zinc Sheeting. C.—Pit. D.—Wing of Zinc Sheeting, 18 feet long.

of locusts; every other farmer contenting himself with selfishly driving them into his neighbour's veld or lands. Yet the labour entailed in this selfish way of getting rid of the pest, is incomparably greater than Mr. Meintjes's method of destroying them,—all hands at work for three or four weeks, the general routine of the farm neglected and then the locusts conquering in the end.

The expense and waste in wages, capital and labour, of the present manner of fighting the locusts is lamentable; and yet, funnily enough, the great argument used by farmers to whom I have mentioned it, is its expense. But is it expensive?

1. One year's crops will yield the price of the sheeting several times over.
2. This zinc sheeting may be used for years if kept in a dry place and occasionally rubbed up and burnished.
3. A *theory* might prove expensive, but this is a *working system* that a practical farmer finds less expensive than any other method.

Mr. Meintjes's system also allows for long spare lengths of sheeting to be used against swarm of locusts in the veld. The swarm is, towards evening when the locusts are gathered together and settled, imprisoned in a ring of sheeting; and next day at the farmer's leisure holes are dug against the sheeting *within* the ring, the locusts are driven by flag-drivers into them and there buried.

Compare this certain system of extermination with the uncertain one of spraying with soapy water

During the six weeks of the "voetganger" stage, every single swarm of locusts will, I consider, at one time or other arrive at some cultivated land; and if Mr. Meintjes's system was generally in use, it would mean that no single swarm within ordinary farming districts would be allowed to attain to the flying stage

If statistics were taken it would not surprise me to find that 60 per cent. of farmers in the O.R C. and upper part of the Cape Colony have this year lost their crops by locusts.

In view of this, would it not be advisable, for the Government to abandon the "soap and water" system as a bubble that has burst, and devise a scheme by which farmers may obtain the zinc sheeting at the lowest possible figures

Pamphlets printed in English and Dutch explaining this system, and well circulated by Field-cornets, might help in gaining a general co-operation in the ranks of the South African farmers.

Trusting that through the medium of your valuable *Journal* this new method may become known and prove a blessing.—Yours, &c.

INTERESTED.

Colesberg, December 28, 1904.

Another Plan for Locust Destruction.

To the Editor AGRICULTURAL JOURNAL.

SIR,—On reading paragraphs like the enclosed—[a quotation from the Queenstown paper describing the ravages of locusts at Whittlesea where the crops were swept off]—one is apt to wonder if no suitable method has ever been discovered of dealing with this plague year after year. It appears to be on the increase, not only in numbers, but in voracity I would suggest that, through your pages, farmers and others interested would give their opinions on the best means of overcoming, or at any rate, diminishing this pest.

Our experience about here is much on a par with Whittlesea farmers. With two years of drought and locusts galore our lot has been anything but a happy one. From all accounts the whole Colony has the same tale to tell, and if locusts are to increase unchecked, I am afraid the agricultural prospects of the country will be entirely ruined.

One would think that this was quite as much a matter for compulsory legislation as scab. In my opinion it is at present causing greater loss, as not only the sheep farmer is affected, but the whole agricultural industry. As it is only with the locust in the voetganger stage that an attempt could be made, we must study their habits so as to form an idea how best to destroy them I will only deal with very large swarms in bringing forward my suggestion, as small swarms are easily destroyed by means of spraying &c I have noticed that voetgangers always go in an easterly direction with a slight inclination to north-east. When on the trek, although the swarm may be several miles long, it is never of very great width. I have seen them coming along an old roadway not more than twelve feet wide for days at a stretch. Some farmers take advantage of this and have trenches dug in the line of march, which are covered in when full of locusts.

As all farmers know, when once the leaders have formed the track, it is impossible to turn the body of the swarm from that track. These peculiarities have led me to make the following suggestion which, although it may not be workable, will probably lead to some better plan.

I cannot describe my idea better than by calling it a system of troughs. As I am unable to fully explain the shape of the trough, I am sending you under separate cover a rough model of one. As you will observe, the troughs are meant to hook on to one another to form a continuous line. For dealing with a swarm threatening cultivated lands or travelling across the veld (not feeding), I would place the troughs in a Λ shape so that the outer troughs would extend slightly beyond the track of the swarm. Where the troughs come together, an opening, say twelve inches wide, would be left in which a flat shallow pan must be placed. Crude pretroleum or any other suitable insecticide must then be poured in the troughs and pan not deeper than quarter of an inch, the idea being that the locusts jump into the oil and *out again*, so as not to fill up the troughs and pan with dead bodies. I have noticed that it is only necessary for the locust to get his feet wet with petroleum, he then gives a few hops and dies.

The troughs must be made, say, 8 feet long 6 inches wide 2 inches deep, and of a height sufficient to prevent the locust jumping over. The pan to be about 12 inches wide by 18 inches long and 2 inches deep. If this could be placed in the ground so as not to form a barrier to the locust it will not be necessary to trouble much about keeping the troughs replenished with oil, as the locusts will all converge on the apparent opening, and as the pan would be too large to jump over they are forced to jump in, and then out again. Zinc troughs, made to fit into one another for convenience in handling, would, with care, last many years. As to initial cost, I should say about 5s. per trough would be about the mark. Co-operation in this matter would of course greatly reduce the cost to the individual farmer, besides rendering it more efficient.

The angle at which the troughs are placed depending on the equality of the ground and the width of the swarm.—Yours, &c.,

FARMER.

Griqualand West, December 8, 1904.

A Locust Trap.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have sent you a plan to make a locust trap, which is very handy and very deadly when the locusts are young. I make my trap as follows: - I get two ceiling boards, 12 feet long, and saw them through the centre. I take one piece and cut it into 2 feet lengths, and two I cut into 18 inch lengths. The 2 feet lengths are for the bottom, the 18 inch lengths are for the back. Then I make a square of bottom and back, and nail a support to the ends like a triangle, and then I nail the long board to front and back, and top of 18 inches Then I have four yards of sail cloth which is tacked to the front and back, and forms a trough to hold soapy water. If the cloth is not broad enough to reach the top of the back any cheap cotton cloth will do. Set this in front of a swarm of young locusts and drive them into the water. I sometimes take a couple of sheets of corrugated iron and place one at each side to keep the locusts from passing the water. There is very little trouble with them after they get a dip in a nice strong solution of soapy water. I like a little paraffine in the water or sheep dip. I have a thin bag with me which I pop them in, and then the water is not lost.—Yours, &c.,

MEMBER OF THE LOCUST BOARD, EAST LONDON.

Fluke in Sheep.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—A number of our sheep have been suffering from some complaint that causes the throat just under the chin to swell, and the animal gradually gets poor. The swelling, when cut, discharges a clear liquid like water, but the cutting does not appear to do any good, as it is in the same condition the next day. Most of the sheep that suffered from this complaint have recovered without treatment, but a few have died, and the skins from those when dried have a glassy appearance, being almost transparent. If you could give us any information as to the cause and treatment of this complaint, we should be very grateful for your assistance.—Yours, &c.,

SARGENT BROS.

The symptoms described indicate the presence of Fluke, which was dealt with fully in the last issue of the *Agricultural Journal.*

The Molteno Cattle Disease.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—With reference to the paper read before the Fruit Growers' Association at Molteno by Veterinary Surgeon W. H. Chase, of a certain disease amongst cattle in that district, it may be of some interest to the Molteno farmers to give them my experience. My cattle are running in a vlei, and ever since the drought commenced I have been losing cattle every year, especially when the veld is dry and all kinds of weeds are growing which can withstand the drought. The disease very much resembles the description given by Veterinary Surgeon Chase. I have tried every remedy recommended, but without avail, until a friend advised me to try and dose my cattle with paraffine as a preventive, which I have done, and since I have dosed my cattle, I do not lose so many. Every time when a beast get sick, I dose all my cattle, with the result that the disease stops at once and does not reappear, sometimes for twelve months.

Dose.—Half a cup of paraffine, with half a bottle of fresh milk.—Yours, &c.,

C.

Lady Grey, December, 1904.

Bone Meal and Lamziekte.

Mr. H. E. Marshall, R.M. of Humansdorp, kindly forwards the following letter:—

SIR,—The Divisional Council of Humansdorp having supplied me with a quantity of bone meal to try its effect as a preventive of Lamziekte, I herewith beg to report to you on the result. In addition to ordinary farming, I also speculate in cattle, so that I have always a goodly number on hand. Death by Lamziekte was by no means uncommon among them. Change of veld being considered a preventive of the disease, I used to drive my cattle twice a year to Zitzitkamma, but with no satisfactory result. I at last commenced giving crushed bones, which the cattle ate readily, with the result that for three years I had no trouble with the disease. Then the supply of bones being exhausted. I neglected getting a fresh supply, and for six months the cattle got no bones, but what they chanced to find for themselves. During the six months four cows died of the disease. The Divisional Council then supplied me with 1,000 lbs. of bone meal, with the request to furnish a report when the supply was exhausted. I have used the meal for two years—have never during that time given my stock change of pasture, and have not lost a single animal by the disease, while all stock are in excellent condition. The use of bone meal also seems to improve the productiveness of the stock, as the cows calve regularly in the season. I generally lost half the calves born every year. This season out of twenty-seven calves only one has died of diarrhœa. The cost of bone meal per head per annum is about four shillings. There is always some meal in the troughs so that milch cows can take as much as they want, while the other cattle are brought in once a week to obtain a feed. I give my sheep an occasional feed of the meal. The result is excellent, the number I have being in perfect condition.—Yours, &c.,

H. E. S. POTGIETER.

Honeyville, Humansdorp, December 29, 1901.

Lime and Sulphur Dip.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Anything written by an experienced farmer bearing the name of Southey is beyond doubt entitled to respectful and earnest consideration. Let us therefore carefully examine the suggestions contained in the letter appearing in your last issue and the possibility of their practical application.

Mr. Southey suggests that:—

1. The use of Lime and Sulphur should be encouraged even to supplying it free to the farmers.

2. That Lime and Sulphur is not detrimental to the wool and quotes and refers to coast wool-men's opinion in support.

3. "Almost every imported dip is useless," and he would "prohibit the use of all imported Dips."

Now, let us examine these points one by one:

1. The use of Lime and Sulphur requires that the ingredients shall be accurately weighed out, thoroughly and carefully boiled and heated and kept hot. Will Mr. Southey tell us, if its use be made general, how he proposes that the necessary boiler, tanks and fuel are to be provided on every farm over that enormous tract of treeless veld, offering no fuel but the mest, which is often insufficient for ordinary household purposes? He is most careful to emphasise that Lime and Sulphur indispensably require "*proper quantities*, *properly mixed*, and *properly used*." Mr. Southey is perfectly right, but, knowing the farmer as he does, how would he propose to ensure the carrying out of these conditions indispensable to the use of Lime and Sulphur, viz.: *proper quantities*, *proper mixing*, and *proper use* by every Colonial Sheep-owner, English, Dutch and Coloured? These are the practical problems to be faced with regard to the general use of Lime and Sulphur. The Government tried Cold Water ready-made Lime and Sulphur and, in Parliament, admitted it to be a complete failure.

2. With regard to the injury done to wool by Lime and Sulphur, Mr. Southey evidently does not know that this oftentimes cannot be discovered until the wool comes to the process of dyeing and the unfortunate manufacturers find the lime has so permeated the wool as to prevent it taking the colour properly, causing it to come out dull and dowdy with irregular shades, instead of bright and lustrous and uniform in colour. I send you and Mr. Southey samples of dyed Lime and Sulphur-dipped wool, showing this fault, and others free from it. It is because of the impossibility of always detecting this injury that some wool manufacturers have ordered their buyers to avoid purchasing any wool from districts where Lime and Sulphur Dip is used. For the same reason, opinions formed from simple inspection of the wool, offer no safe guide.

I am sending Mr. Southey direct by post, and to you also Mr. Editor, copies of letters from leading wool merchants, Manufacturers and Experts in England, America, Australia, France, Belgium Germany, and Austria, many scores of them all asserting that Lime and Sulphur Dip depreciates the value of the wool, and urging the abandonment of its use You find amongst them the opinion for which the Agent-General for the Cape asked the Bradford Chamber of Commerce, who told him such a Dip was "*very detrimental to the wool.*"

These firms and men are well known and of the highest repute Their opinions are perfectly independent and unbiassed and, whatever attempt be made to minimise them, they cannot be gainsaid, and are as much entitled to respect as Mr Southey's or any South African wool buyer. Moreover, the important factor is that these European manufacturers are they who regulate the price of South African wools, and, for this reason, their opinions are a matter of far more serious concern to the farmer than those of the local buyers whose prices are regulated entirely by values in Europe

3. The third of Mr. Southey's points, which we are examining, is that imported Dips are useless and their use should be prohibited. This is simply Mr. Southey's opinion against that of thousands of South African farmers, who themselves, during last year alone, used sufficient of the Dip with which I am identified, to bathe over seventeen millions of sheep, and they have been doing this more or less for the past twenty-five years I shall be happy to show Mr. Southey our books in proof of this if he wishes.

Would Mr. Southey have us believe these thousands of his fellow farmers so senseless as to go on spending their money uselessly all through these long years?

He will give much more effective help in Scab eradication if he will continue to exert his great influence to impress upon farmers that nothing really worth having is to be obtained in this world without effort, and that the one thing above all others most needful to scab eradication is *care and thoroughness* on the part of every man in his effort to cure Scab

Dips however good are but dead instruments and only men's right handling of them can give to them the life and energy essential for the perfect prosecution of their work

If the Minister of Agriculture be well advised in shaping his new Scab Act, he will make it *insist upon every farmer cleansing his sheep of the disease, leaving him free to choose his own means*, but giving him no rest or peace until these are effective.—Yours, &c,

S. ROWLAND TIMSON,
General Manager,
William Cooper and Nephews, M.R.C.V.S.

January 11th, 1904.

Stockholm Tar and Sheep Dips.

To the Editor AGRICULTURAL JOURNAL

SIR,—In your January number an interesting letter appears from the pen of Mr. W. R. Southey, Schoombie, on "Scab in Sheep and its Eradication. So much has been said, and *comparatively*—so little done, that *one can be excused for* "*pegging*" away at the subject, until something more *is* done. It appears to me that most letters written on this subject deal rather more with the cure than the prevention, and as "prevention is better than cure," I would like to see preventive as well as curative methods employed if the first-named is possible.

The following personal experience would appear to prove that Stockholm tar is a valuable preventive dose. During the drought of 1903 one of my flocks (sheep) was absolutely "rotten" with scab. Dipping was out of the question, as I had barely sufficient water for drinking, let alone dipping. In addition, the sheep were in very low condition. Thousands of "trek" sheep passed through my veld, which, in addition to reducing the bushes to powder, supplied a first rate reserve of infection for the future. About October (in that year) I dosed the sheep with Stockholm tar boiled with water, and in two to three weeks time observed not only a distinct improvement in condition, but a very evident diminution in the number of "scratching" sheep. About the 15th December I dipped the flock *once* (wool was twelve months' growth) in a preparation of Hayward's Sulphur Paste Dip and Nicotine ("Excelsior brand). Rain fell soon after, and when the Inspector came out he could hardly believe they were the same sheep,

In February, 1904, I sheared and dosed with *pure* Stockholm tar. In October I repeated this, and to-day look as you will no scab can be found.

This result constrains me to the belief that Stockholm Tar is helpful as a preventive dose, and I purpose dosing every three months.

I think, generally speaking, farmers realize that methods which may be successful in one case may not, of necessity, be so in another, on account of variation in conditions, and whilst quite endorsing Mr. Southey's statement that "any farmer who says he cannot cure scab with lime and sulphur dip, talks nonsense," yet I am not prepared to go so far as to exclude all imported dips. True, there are dips —as well as other things—which can be classified "good," "indifferent," and "bad," but to exclude all on account of the "black sheep" (which, as the saying goes) may be found "in every flock," would, I fear, be a very doubtful expedient.

The much-debated question of the effects (injurious or otherwise) of lime and sulphur dip on wool is also touched upon by Mr. Southey.

Not being in possession of the pamphlets referred to by Mr. Southey, I would like to know were the "experts" brokers or spinners? The last-named, I take it, are the best people to decide the question.

Whilst Mr. Southey can show lengthened and satisfactory immunity from scab obtained by the use of lime and sulphur dip, I daresay others can show as good results from the use of other dips. Here, again, results may or may not be affected by circumstances, such as stray scabby sheep gaining access to our camps, &c., &c. I mention this to shew that before one can settle a question to complete satisfaction, he must obtain the fullest possible particulars.

With Mr. Southey, I sincerely hope to see competent Inspectors appointed, men who will carry out their duties without fear or favour. To say that such do not now exist would be unjust, but I am afraid they are few and far between.

PERSEVERE.

Dwaal, Jan 19.

Jumper *versus* Diamond Drilling.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In times past nearly all drilling was done either by Diamond or small Jumper drills.

Now we have the latter from 6 inches upwards, worked by power. Having had a 6 inch "Star" at work on my farm I observe a feature which I believe is not found in such aggravated form at least, in work done by Diamond or smaller Jumper drills. At one site I had a 6 inch hole jumped, strong water being obtained. The results of the steam pump tests proved that the water could not be lowered beyond a fixed point.

Levels being most suitable, I laid down a syphon. A week before starting same I tested the water with a pump, nearly double the capacity of the syphon, and results tallied with the steam tests after making due allowance for difference in capacity. After the syphon had delivered approximately, the same quantity of water as the pump, the water lowered to a very much lower level than on the occasion of the previous steam and pump tests,

When the syphon was stopped I expected to see the water rise rapidly, as on previous occasions, but it didn't, in fact it took four days to do what it used to do in as many hours

The cause of such a sudden and serious shrinkage—at least apparent shrinkage,—engaged my attention, but the experiments seemed inconclusive. One time the water would rise fairly quickly, the next more slowly, and so the solution seemed as far as ever.

A gentleman told me, what a friend of his told him, which runs as follows:—

His experience of 6 inch Jumper holes went to prove that at the outset such supplies were unsatisfactory in as far as the veins or feeders got choked with sand &c, in the process of delivering the water into the bore hole.

In course of the time these would "self-clean," and, the subsequent supply be regular and satisfactory.

Without dogmatising, I must say I am inclined to this belief as a result of my experiments,

Should such explanation be correct I would like to know how long these veins or feeders will take to "self clean."

1st in drought.

2nd after a decent rainfall.

PERSEVERE.

Dwaal, January 19th.

Ragwort Poisoning.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Reading in the December issue of the *Agricultural Journal* Mr. W. H. Chase's exposition of the Molteno cattle disease, I may inform you that a number of cattle have died here under similar circumstances. One of my own young cows died and everything points to a close similarity. Had Mr. Chase's published post mortem been available for our guidance, no doubt we could have fully established our case.

As no one here is able to identify correctly *Senecio Burchellii*, otherwise Ragwort, I have sent you a veld plant to a certain extent bearing its description. The correct identification of the plant would, no doubt, enable us to arrive at the cause of the disease here.—Yours, &c.,

A. MATHER.

Gwadana, December 12, 1904.

The specimen sent us is not the *Senecio Burchellii*, but an allied species, probably the *Senecio juniperinus*, L.J. We had a similar report regarding the *Senecio rigidus*, L., recently, hence I suspect that most of the senecciones have a similar effect on cattle eating them. Surely such facts indicate the need of a crusade against weeds.—P M.O.

Farriers' Licences.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In reply to Mr. W. T. Sampson, on the above matter, in the December issue. Mr. Mostert's proposal was intended to prevent men—having little or no knowledge of what is really required of them in the shoeing of a horse—from passing themselves off as farriers; men who because they happen to know something of working at the blacksmith's forge, take up this branch as an additional.

To this end Mr. Mostert proposes that before any man should be allowed to put up a sign board to that effect, or pass himself off as a farrier, he should pass an examination and be duly certificated or licensed, due provision being made in the same direction for the assistants employed under him.

At the same time provision might be made for outside country places where there was no possibility at present to obtain a certified farrier.

Mr Mostert wishes me to add that he quite approves of Mr Simpson's suggestion that Mr Hutcheon, as the chief Veterinary Surgeon, should call a meeting of Master Farriers at the forthcoming Rosebank Show to see what could be done in the matter, or failing Mr Hutcheon doing so, that those concerned should come together in order that a scheme might be taken in hand for the furtherance of a Farriers' Association.

I may mention that our Association has sent to England and to the United States for particulars as to the laws and rules carried out there for the due protection of horse owners and farriers.

Of course if no start is made in this country in the matter we shall never get any further, and it is quite time something was done.—Yours, &c.,

JAMES GRIBBLE,
Secretary Paarl Farmers' Association.

Paarl, December 1904.

The Working of Syphons—Information Wanted

To the Editor, AGRICULTURAL JOURNAL.

SIR,—On several occasions I have observed letters from Engineers (in the *Agricultural Journal*) in reply to questions asked by your correspondents. Perhaps one of these gentlemen would be so kind as to give me some "light" on the following *re* the working of a Syphon:—

At sea level atmospheric pressure would support a column of water in a tube (if a vacuum were created) 34 feet in theory, but only 26 feet in practice.

At this altitude (viz. 4,500 feet) 22 feet would be about the mark.

1. How does friction (in the pipes) act in relation to fall?

   To illustrate this query, say—

   A. Length of syphon piping is 1,700 feet, with a 20 foot fall. This would work excellently.

   B. Length of syphon piping is 1,700 feet, with 4 feet fall. Would this work?

2. Would "fall" have to be increased as "length" increases, so as to allow for friction?
3. If so, at what rate?
4. Does delivery of water lessen as the level (water) lowers?
5. If so, how many gallons per foot reduction if a 2 inch pipe was employed?
6. When syphon is working, does all the piping keep full of water?
7. Can air enter at discharge end of syphon and destroy its action?
8. If so, how and when?

"PERSEVERE."

Dwaal, December 20.

Manuring Sweet Potatoes.

To the Editor, [illegible] JOURNAL.

SIR,—Could one or more of your readers inform me, through the medium of the [illegible] what constituents that cannot be replaced by stable or kraal manure, a crop of sweet potatoes removes from the soil.

[illegible] the general experience is that sweet potatoes may be planted [illegible] yield a good crop the first year, the second year less.

and the third year practically nothing, although well supplied with farmyard manure; it then produces plenty of leaves, but no tubers.

As far as I know, the permanent soil is a coarse gravelly, sand, about one foot in depth, overlying a bank of pot-clay, with good drainage in winter, but, as I remarked, only once out of three times a really good yield is obtained.—Yours, &c.,

LEERGRAAG.

The best manure for sweet potatoes is undoubtedly well rotted kraal or stable manure. It may with advantage be composted with black soil from the bush—that is to say, mixed in layers with leaf mould and allowed to rot, turned over once or twice till the whole is of an even texture throughout. This takes a few months to prepare. It is highly likely that a dressing of sulphate of potash or muriate of potash applied at the rate of 80 to 100 lbs. per morgen would have good effects on the sweet potato crop along with stable manure the third year. The correspondent is, however, expecting too much from his land. Three consecutive crops of the same kind from one piece of land is exhaustive treatment, and he would be well advised instead of planting sweet potatoes a third time to try a crop of beans or peas for a change, putting in sweet pototoes again the following season.—E. A N.

Wild Animals in Captivity.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—As a subscriber permit me through your valuable journal to make a few inquiries about the domestication of large game, asking kindly from *all* who have seen, such as Eland, Buffalo, Zebra, the Sable and the Roan Antelopes, the Blue Wildebeest, &c. I shall be extremely grateful if you or any of your subscribers would answer some of the following questions in your *Agricultural Journal*:—

1. Do any of the above-named animals breed in captivity ?
2. If inter-bred with cattle, is the off-spring a mule, and thus puts a stop to further issue ?
3. Have any ever been used for draught, riding, or milk purposes ?
4. Are they likely to exhibit vice when handled ?
5. The Burchell zebra—does this animal inter-breed with the donkey mare, and what is the offspring like ?
6. Would you kindly give a few particulars on Groote Schuur Game, which would be very interesting ?

Trusting that you will be able to give these matters a few minutes of your valuable time,—Yours, &c..

SUBSCRIBER.

A Crop Failure.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Last year, on a newly broken-up field of about 80 acres, I planted mealies and turnips. This year I have the field all under mealies. Now that the mealies are a fair size, I am amazed to notice that those where the turnips had been are only about one-sixth of the size of the others. In sowing the turnips last year a strip of about six yards in width was missed, and there the mealies are as fine as the best, so that it can be no difference in the quality of the soil.

I have often grown mealies after a crop of turnips, but though they have not been of first-class quality, they have been nothing as bad as this

Can you advise me what I should do as it is a serious matter for me, as I have to go in largely for artificial feeding? Would a crop other than mealies be better or shal I be obliged to manure?--Yours, &c.,

JOHN G. LAING.

Cala, Dec. 30th, 1904.

This is a very interesting problem. Obviously, as the correspondent says, the difference is not due to variation in quality of the soil. As far as can be judged from the facts offered, the apparent prejudicial influence of the turnip crop can only be due to the physical condition of the soil after they were lifted. Possibly below the first mealie crop the soil had remained looser and more mellow; perhaps that under turnips was more trodden down and hardened or exposed to the drying influence of sun and wind. If the first year's crops of mealies and turnips were harvested at different dates, this would lead to the land having to be prepared at different seasons for the ensuing mealie crop. Whatever the cause it is difficult to suggest anything to take the place of mealies, except perhaps Kaffir-corn, and the probability is that a similar result would then be found. From the letter it would appear that the harm done i more marked than it used to be This certainly points to the advisability of using manure, preferably stable and cow shed dung or kraal manure applied to the land before sowing the turnip crop.—E.A.N.

Fungous Disease on Apricots.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—By this post I am forwarding samples of apricots which, you will note, are blighted by small brown spots. I shall be pleased if you will advise a remedy.—Yours, &c.,

STANLEY P. SHERRY.

Grahamstown.

The apricots are badly decayed and completely covered with fungous growth of different kinds, so that it is impossible to see the "small brown spots" referred to by the correspondent. From other observation I feel safe in saying that the trouble is due to a fungous disease affecting both fruit and leaves. The disease has not been studied in this Colony. Spraying experiments conducted in my private garden during the past winter and early spring indicate that spraying thoroughly with Bordeaux Mixture (See Spray Calendar) once before the buds open and then soon after the fruit is set, will be a great help. A third spraying, when the fruit is, say, half grown, may be necessary to give the best results. Further experiments are necessary to afford really decisive information.—C. W. MALLY, Entomologist.

Sunflower Seeds

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I should be obliged if you would kindly inform me whether there is any market in this country for sunflower seeds, and, if so, what is the average price per lb. or per bag?

As a flower they grow especially well in this district and also in many cases in the lands. I believe the seeds make excellent poultry food.

Could you also inform me where to procure seed in sufficient quantities at a reasonable rate?—Yours, &c.

P. C. J.

Bushmans Kop, O.R.C.

We know of no existing market, though, as suggested, sunflowers are an excellent poultry food. In Europe sunflower seed is crushed on a large scale for the valuable oil, and the resulting "cake" is highly esteemed as a food for stock. This is an example of the position of several possible sources of profit for farmers in South Africa. The crop can be grown, but for lack of a reliable market, the farmer cannot grow it, while, in turn for want of a guaranteed crop of so many hundred tons, the merchant cannot see his way to buy it, nor can the manufacturer set up plant with some assurance as to supplies and price. This vicious circle prevents all progress. The farmer must undertake to sow so much land and the merchant to buy at a fixed price, and then only can, the work on both sides be undertaken. Any firm of responsible seedsmen can supply sunflower seeds.

How to Tame Bees.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Boxes into which bees are put should be clean and sweet, and should be made attractive by rubbing the inside with some syrup made of sugar and water or smear the inside with some cow's dung and let it dry before putting in the bees or rub the inside with some melted wax (bees). In the swarming season swarms will go into such boxes of their own accord Put sacks over the boxes also smeared with dung and shelter them during the heat of summer.

Let them fill themselves with honey before they are robbed and they will soon become quite tame. This they will do in about five or seven minutes' time after they have been smoked Never rob the bees of all the honey in the hive and do not take any at all during the dry season, i.e., when nectar is scarce. Bee veils and smokers can be had of Messrs. Lloyds & Co., Burg Street, Cape Town, also Bar-frame hives and the Queen Excluder which serves to keep the queen in the brood compartment only. To further tame them, do not kill any when taking honey, and should they wilfully sting the hands, rub same with a few drops of a solution of carbolic acid and water (half of each) —Yours, &c.

A. K.

Stellenbosch,
January 17th, 1905.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have just seen in the last *Journal* a gentleman from Harrismith, O.R.C., named J. G. Liddell, is asking for advice how to make bees tame so as not to leave after catching. The best way is to get a piece of Spanish reed or a Fluitjie reed; cut it open on three sides, just the size to let the bees in to feed the queen. Keep her in the reed for about three weeks, then open the front and you will find that she will never leave again. But you must be careful when you are searching for the queen which is of a yellow colour, whether there are not more than one.—Yours, &c.

C. J. BOOYSEN.

De Doorns,
January 13.

To the Editor, AGRICULTURAL JOURNAL.

SIR, To get a swarm of bees to stay in a box.

Get a section of a Spanish reed, leave the top closed and open the bottom, then cut a hole across the grain near the top and another near the bottom, slit the reed from one hole to the other making a long narrow opening from hole to hole. If carefully cut and slit the neuters can get in and out to the queen where slit joins holes. Catch the queen and place her inside the reed then close the bottom with a cork. Tie the reed cork downwards in a warm corner of the box and when combs are formed the queen bee can be let out of the reed with safety, and the reed can be used for another queen.—Yours, &c.

LOVER OF BEES.

Moshesh's Ford, January 18.

To the Editor, AGRICULTURAL JOURNAL

SIR,—In reply to J. G. Liddell's query *re* bees, page 123, January issue. In putting a swarm of bees into an ordinary box, care should be taken that a clean box or hive is selected; bees have a great dislike to any article which has been occupied by domestic pets or mice. It would be better to use a properly constructed bar frame hive, and thus have control of swarm from the start. If your correspondent can arrange to fix a piece of comb in the box, containing young grubs, in all stages of growth if possible some in the hatching stage, there will not be much likelihood of the swarm deserting; other conditions being normal. There can be no objection to placing a piece of queen excluder zinc at the entrance of hive for a few days, till the swarm has settled down to work. J. G. L. may have hived a "Cast" instead of a natural swarm, the former containing perhaps several queens "Casts" are very erratic in their movements.

In selecting bees for easy manipulation your correspondent should obtain the yellow South African bee, in distinction to the black bee, the lighter coloured worker will be found most docile.

"Bee proof wire" alluded to by J. G. L. is a sheet of zinc having oblong perforations which will allow the worker bees, but of such dimensions that a fertilized queen cannot get through.—Yours, &c.

HY. L. ATTRIDGE.

RURAL REPORTS.

For the month ending 15th January, 1905.

Aberdeen.—Prevailing weather here windy at present. The rainfall for the month has been light and below the average. Veld is in very poor condition, and locusts have devoured all the grass there was. Mealies have been sown heavily, but prospects of a crop are poor. Lucerne and fruit promise well. Cattle are not in very good condition on account of the drought. Horses, mules, etc., remain in about the same condition as before. Sheep and goats are also suffering on account of the drought. Ostriches are in fair condition.

Bedford.—Rainfall for the past month has been very much below the average—*i.e.*, 0·75 inches, as against 3 or 4 inches of other years. South and south-west winds prevail, days being hot and mornings and evenings cold. Veld is in a deplorable condition, and appears to be quite dead. Locusts have disappeared, apparently having been destroyed by birds, etc., in the "voetganger" stage. Cattle are in very low condition, many cows dying from poverty. Calving seasons have been fairly good, as far as the health of the calves is concerned, but many have died with their mothers. Slaughter stock very scarce. Sheep and goats are doing fairly well in some places, though somewhat troubled with scab. Ostriches doing very badly. Few chicks have hatched out, and both young and full-grown birds are dying on account of the drought.

Clanwilliam.—We have had frequent storms of wind here lately, and the rainfall has been fair, better than last season. Veld is in fair condition. Splendid harvests have been obtained of wheat, oats, and other grain. Fruit is good all round, though apricots are infested with worms. Vines are in good condition and crops promising. Livestock of all descriptions are in good condition, and there is very little sickness. Horses are fetching good prices. Riding animals £30, draught ones £50 to £60 per pair. Mules £20 to £30. Breeding mares are scarce. Goats have bred very well this season.

Griquatown.—Though weather promises every day, no rain has as yet fallen, and veld is in fearfully bad condition. Oats are pretty fair. Livestock generally in poor condition and scarce.

Herbert.—The drought continues, and is becoming extremely serious. Stock generally are falling off in condition daily, and already dying of poverty, in fact farming matters are much worse than in November last year, or at any time during the past 30 years. The river has practically dried up, and the water left in the deeper pools is stagnant, and has a horrible stench, and is unfit to drink. Fortunately there are a large number of wells on the locations, and the Natives are utilizing them as far as possible for watering their stock and domestic purposes, as it is dangerous to send any stock to the river to drink. Owing to the mud fringing the water holes, the animals go in and get stuck fast, and in many cases die if not assisted out immediately. Although stock are poor, they are healthy, and no diseases have been reported.

Kuruman.—Prevailing weather hot and stormy without rain. The rainfall has been light, the early part of December was exceedingly dry but a nice rain fell about the 15th. Veld at present in good condition. Wheat and oat crops are very poor. Sowing of mealies and Kaffir corn has begun since rain fell. Cattle are in fair condition and no sickness is reported. Horses fair, donkeys doing very well. Cape sheep doing very well, very few merinos. The few Angora goats here are thriving. Cape goats not doing as well as usual. Ostriches are in fair condition. Wild dogs doing a considerable amount of damage amongst wild birds. Pigs fair.

Oudtshoorn.—Weather throughout district has been fine but dry, hot and windy during the past month. There has been very little rain and veld is consequently in dry condition. Good crops of wheat, oats and other grain have been harvested. Lucerne is now growing well especially since the disappearance of the caterpillar. Fruit does not promise as well now as it did earlier in the season. This is mainly on account of damage done by winds. Red scale still very prevalent and, in ward Wynand's River, apple trees are also diseased. Cattle are generally in very good condition and healthy. Horses, mules and donkeys in very good condition and fairly plentiful. Prices fair but have fallen slightly. Sheep and goats are in fair condition and free from scab, Ostriches are doing well and pluckings promising, chicks healthy. Pigs thriving,

Queenstown.—We have had unusually cold weather this month with strong winds from South-West prevailing. Veld is in very bad condition. Locusts have disappeared large numbers having been destroyed by birds. No crops have been reaped, nor are any at present growing and it is now too late to sow mealies, so that there is no prospect of natives having a sufficient food supply for the coming winter. Stock of all descriptions are still in poor condition. Most of the large stock have been taken away for grazing.

Sprinkbokfontein.—The rainfall for the past month has been about the average. Weather on the whole dry and veld needs more water. Wheat and other grain doing well. Peaches and quinces good, pears and apples bad. Cattle in good condition, as are also all other livestock.

THE TRANSKEI.

For the month ending 31st December, 1904.

Bizana.—Welcome rains fell towards the middle of the month, which have changed the aspect of everything, though not nearly enough to thoroughly saturate the ground. The people have been busy sowing and ploughing. Stock is in very fair condition and no serious outbreak of disease has been reported. A suspected case of Glanders in the village was reported last month, and the contacts were strictly quarantined and the Veterinary Surgeon sent for. On testing these, one horse was found to be infected and promptly shot and buried. No further outbreak has occurred.

Cofimvaba—Only 2·24 inches of rain fell last month, and, in consequence, it has not been possible to plough to such an extent as usual, especially in the south and south-western portions of the district, where the rainfall was less than in other portions, and should rain come now it would be too late to plant cereals, the season being too far advanced. Stock generally have not improved much, and the loss of sheep especially has been great, indeed, it is estimated that about thirty per cent. have died from poverty. An outbreak of redwater occurred during the month, two cattle dying from it. The area has been quarantined and steps taken to prevent the spread of the disease. With the above exceptions stock of all descriptions are fairly free from infectious or contagious disease.

Elliotdale.—During the early part of this month a nice rain fell which enabled a little ploughing to be done, but since then no rain has fallen, and hot, dry winds have prevailed, scorching up everything, and consequently the veld is in a bad condition, and very little prospect of any mealie crop. The season has now far advanced, and it will be too late to sow grain with any prospect of a crop. The price of mealies has now considerably advanced. There is absolutely no tobacco crop. Locusts have also made their appearance, and are at present confining themselves to the coast, where there is a little green grass Altogether agricultural prospects in this district are bad. Stock of all kinds are in fair condition.

Flagstaff.—The past month has again been very dry, and the young standing crops are becoming parched. Unless more rain falls in the very near future, the grain crops will be a failure. Stock are doing well, are free from disease and in good condition.

Idutywa.—I regret to have to report that there is no improvement in the outlook for the people in this district. There was a little rain during December, 1904, and a little ploughing was done, but there has been very dry and windy weather since, with the result of drying everything and causing the position to be worse than before. What little grass there was has all become parched.

Kentani. Sufficient rains fell about the middle of December which enabled the people to put in the season's crops of mealies and kaffir corn, since then dry weather has prevailed and unless rains fall soon to bring on the young plants, the prospects of a good harvest will be bad. The pasturage is in good order towards the coast, but poor inland.

Libode.—The drought has not yet broken although a few showers of rain have fallen. The natives have ploughed in places and some of the crops have come up but are not doing at all well. Stock of all kinds are still in very poor condition there being very little for them to eat.

Lusikisiki.—Weather hot, rainfall slight and below average but veld still in good condition. The mealie and kaffir corn crops are in very poor condition owing to want of water. Livestock of all descriptions in good condition with the exception of slaughter sheep which are poorly.

Matatiele.—The rainfall during the past month averaged about 2½ inches throughout the District, spread over about 11 days. The heat, however, has been intense and very little progress has been made by growing crops and it is greatly to be feared that mealies and kaffir corn, which are very backward owing to the lateness of the rains, will become a failure. Redwater has appeared in several parts and the outbreaks have been dealt with in the usual manner. Otherwise large stock are doing well and are in good condition. Small stock are also doing well. A swarm of locusts came over the mountains from Basutoland but they vanished mysteriously, probably returning to Basutoland.

Mount Ayliff.—Rainfall for the month has been very light and less than previous years. Weather alternately hot and cold. Veld fair in parts. Mealie and kaffir corn crops are bad. Livestock generally in fair condition with exception of goats which are in low state.

Mount Frere.—There was some rain with very cold weather during the week ended the 17th December, 1904 and this gave the people an opportunity of getting more lands cultivated. Since the 18th December no rain has fallen and the weather has been dry, hot and cold winds alternating resulting in the veld going off and the crops getting scorched. The ploughing season is now over and little more than half the lands have been sown. The growing crops do not promise well and with continued drought most of them will come to nothing or be destroyed by grubs which are very bad this season. Stock of all kinds, with the exception of horses, are doing well and are free from disease. Scab is very prevalent amongst horses and until this disease is dealt with as scab in sheep, is likely to continue.

Nqamakwe.—The drought continues with undiminished severity; springs and streams are drying up, the ploughing season is practically over and no ploughing has been done, and the veldt has the withered and parched appearance of midwinter. In some parts of the district sheep are in fair condition, but generally throughout the district all kinds of stock, but more particularly horned cattle, are in very low state.

Port St. John's.— Weather at present hot. Light rains have now fallen and veld is improving in condition. In the river valleys the growing crops look splendid, but on the higher country the extreme heat combined with scarcity of water makes the prospect gloomy. No diseases amongst cattle have been reported. Scabies amongst horses still exists but not to so serious an extent.

Qumbu.—During the past month there have been several heavy rains and in consequence all the natives have ploughed and sowed their lands but as it is so late in the season the crops will stand a risk of early frosts, which will affect the yield greatly. Pasturage is improving daily and the stock are in a better condition than they have been for some time being, with the exception of an outbreak of lung-sickness, free from disease.

Tabankulu.—During the past month there have been occasional local storms, but no regular rains; consequently the crops are not so well advanced as they should be at this time of the year. Stock of all kinds are healthy and in good condition.

Tsolo.—Moderate rains fell last month and mealies and oathay were sown. The pasturage has now improved and is in some places good. No contagious diseases were reported.

Tsomo.—Two heavy showers fell during the month, the second accompanied by a violent hail storm, which in the absence of standing crops, confined its destruction to window panes. Small stock have slightly improved condition but pasturage is still too poor to benefit the larger stock. Locusts have disappeared since the hail storm. The grain prospects are poor, unless in January we have heavy and steady rains unsucceeded by frosts.

Umtata.—The drought still continues; streams never before known to fail have ceased running and in many parts great difficulty is being experienced in obtaining water for stock and even for domestic use. Cultivation, excepting in one or two favoured localities where slight thunderstorms have fallen, has been impossible. Stock is holding out but great anxiety is being felt by both farmers and natives at the continued absence of the usual rains.

Willowvale.—Stock here are still in good condition and values practically unchanged. Only very little rain fell during the month but ploughing has nevertheless been pushed forward. The fruit crop has been an utter failure owing to the drought.

Xalanga.—Two or three light showers during the month have improved the pasturage a little. All stock are in rather better condition, but have to be kept on the hills as there is no grazing in the valleys. The rainfall for the past year is 11·5 inches, of this nine inches fell in the first three months of the year. Since March the rainfall has been in light showers at long intervals being of little or no benefit to the farmers.

NOTES ON THE WEATHER OF DECEMBER, 1904.

By Charles M. Stewart, B.Sc., Secretary to the Meteorological Commission.

Cloudy weather, with almost daily fogs, mean temperature considerably below the average, a slight increase in the number of Thunderstorms, but with a rainfall two-fifths less than the normal, causing a continuance of the drought, one or two sharp frosts and a marked prevalence of strong Westerly winds were the leading characteristics of the weather of December last.

Precipitation.—Mean rainfall for December last, deduced from the records of 361 rainfall stations amounted to only 1·29 in., falling on 5 days, which is 0·87 in. or 40 per cent, less than the average. A comparison of the subjoined Table with that for last month will show that while there has been a decided increase in the actual quantity of rainfall recorded over the various divisions, except over the Cape Peninsula, the South West, the West Coast and the Orange River Colony, there has been a serious deficit more particularly over the Karoo compared with the normal, except in the South, the West, and Natal, in other words, rainfall has been most scanty where it is most required. The nature of its distribution during the month is well shown by the following summary of the totals for the month,—of the 361 stations 30 reported Nil ; 154 had one inch or less ; 94 had from 1 to 2 inches : 43 had 2 to 3 inches : 27 from 3 to 4 inches ; 9 from 4 to 5 inches while only 1 had over 5 inches, the largest quantity being 5·12 inches at Buffels' Nek.

Division.		Mean Rainfall. (1904).	Mean No. of Days.	Average Rainfall (1891-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
Cape Peninsula	..	1·47	6	0·91	4	+ 0·56	+ 62
South West	..	0·64	4	0·51	2	,, 0·13	,, 25
West Coast	..	0·27	2	0·16	1	,, 0·11	,, 69
South Coast	..	2·28	7	1·69	6	,, 0·59	,, 35
Southern Karoo	..	0·49	1	0·41	2	,, 0·08	,, 20
West Central Karoo	..	0·34	2	0·78	2	− 0·44	− 56
East Central Karoo	..	0 94	3	1·57	4	,, 0·63	,, 40
Northern Karoo	..	0·35	2	1·53	4	,, 1·18	,, 77
Northern Border	..	1·03	3	1·74	4	,, 0·71	,, 41
South-East	..	1·45	5	3·21	8	,, 1·76	,, 55
North-East	..	0·95	4	3·48	8	,, 2·53	,, 73
Kaffraria ..	..	2·50	9	4·07	11	,, 1·57	,, 39
Basutoland	..	2·77	7	..	..	..	..
Orange River Colony	..	1·57	6	..	..	..	..
Durban (Natal)	..	6·44	16	..	..	..	..
Bechuanaland	..	2·84	6	3 58	8	− 0·74	,, 21
Rhodesia ..	..	3·30	9	..	..	..	..

Similarly, the maximum daily falls were in no cases very large ; as, omitting the 30 stations where no rain fell, of the remaining 326 furnishing particulars of the daily quantities, 244 had maxima of 1 inch or under, 75 had between 1 and 2 inches ; leaving only 7 with daily totals of over 2 inches, the two largest being 2·50 inches at Plettenberg Bay on the 12th and 2·15 inches at Swellendam on the 13th.

Thunderstorms were reported from altogether 273 stations on 27 days of the month, most widely from 5th to 8th, 18th and 31st ; these seem to have been most destructive at Main on the 7th and 19th, those on the remaining days being mostly local in distribution. No *Snow* was reported during the month but *Sleet* occurred at 1 station on the 2nd, while precipitation assumed the form of *Hail* at 22 stations on 8 days chiefly on the 6th and 31st.

Temperature, Cloud and Wind.—The mean Temperature of all the stations for December was only 67° or 1·4° warmer than November ; while the mean daily range had decreased to 24 3°. being the difference between the average maximum temperature 79·2° and the average minimum temperature of 54·9°

The mean temperature for the month was everywhere considerably below the average, the deficit ranging from about 1 degree in the South West to 4 degrees in the interior; the deficiencies in the day temperatures were mostly between 0·5 and 2 degrees, but in the case of of the night or minimum temperatures from 1 to 4 degrees, being greatest (4·3°) at Kimberley. The mean warmest station was Kenhardt with 74·4°, the mean coolest being Groot Constantia with 63·7°; shewing a difference of 10·7°. The highest mean maximum was 88·9° at Kimberley closely followed by Kenhardt with 88·8°, while the corresponding minimum of 47·7° occurred at Hanover.

The warmest days were most commonly the 30th and 31st although at a good few stations the highest temperatures were recorded on the 5th and 10th, the coldest mornings were those of the 2nd and 3rd, 14th, 15th and 22nd and 23rd and towards the end of the month at a few stations. The mean of the absolute maxima was 94.3° and of the absolute minima 45·2°, showing a mean monthly range of 49·1° The highest temperature registered during the month was 106·6° at Dunbrody on the 31st and the lowest 37·0° on the 3rd at Hanover, on the 14th at Moyeni and on the 15th at Matatiele thus shewing an extreme range of 69·6°. *Frosts* were reported as occurring on the 2nd, 15th, 21st, 27th, and 29th that on the last date causing some damage to mealies &c., at Table Hill, and Glencairn.

The mean percentage of *Cloud* was 43 or 3 per cent. more than during November; along the coasts it was mostly about 60 per cent. and varied between 20 and 30 per cent. inland rising again to 60 per cent. in Rhodesia; The cloudiest station was Cape St. Francis with an average of 70 per cent. while the sky was clearest at Kenhardt where mean obscuration amounted to only 11 per cent. *Fogs or Mists* were reported from 91 stations on 27 days of the month.

The prevailing winds were Southerly to South Easterly in the South-West and inland, but Westerly along the coasts; *Gales* were reported on 9 days from 24 stations chiefly on the 13th; *Dust storms* occuring mostly on the 13th also were reported from 9 stations and Hot Winds from 14 stations on 10 days. The mean wind-force amounts to 2·31 on the Beaufort Scale corresponding to a mean velocity of 14·6 miles per hour, or 2·2 miles more than during the previous month.

The following extracts from the observers' notes will serve to supplement the above remarks and at the same time serve as an epitome of the state of the country generally:—

NOTES.

Groot Drakenstein.—Temperature of month, low, 2·8 below average of last 5 years. Rainfall in excess of average.

Kenhardt.—On 13th at 7, Dust-storm from South-East. This storm had a remarkable appearance as it advanced from the South-East. At first sight it appeared to be a large volume of smoke advancing with a rotary motion, as it neared the town, it spread out in crescent fashion. The sun was still in the heavens but when the storm struck the town, lamps had to be lighted in the houses. Later during the night, a few roofs were taken off rooms. At 9 p m. the dust cleared sufficient for the moon to be seen No one here has any recollection of a similar storm. The force was not more than 6 (Strong Breeze).

Sydney's Hope.—Rain badly wanted for veldt and crops.

Bedford.—Country terribly dry. Lowest rainfall this year than any for last 21 years. Farmers say never been so short of water

Main.—7th, Thunder and lightning, rain, and heavy wind; houses unroofed, sheets of iron hurled about, 19th thunder, hail and strong wind. Infant school unroofed, sheets of iron thrown over 150 yards away.

Boschfontein.- Unusually cool weather prevailed all through the month, at times approaching frost.

Carnarvon.—Heavy duststorm on 13th, Roofs of three houses removed and all fruit blown off trees.

Waverley.—Terrible drought. Fountains drying up all over the country.

Blaney.—Great heat, dust and wind.

Glencairn.—On 2nd, severe frost damaging crops mealies and potatoes, same on 29th.

Heatherton Towers.—Drought terrible.

Bolotwa.—Worst drought in living memory – worse even than 1862. Indwe and White Kei Rivers stopped running. Heavy losses in all kinds of stock, especially in the Glen Grey district.

Carnarvon Farm.—This is far and away the most disastrous year on record. No crops, and country a desert since 1st April, and myriads of locusts about.

Table Hill. – Frost on 29th nipped beans, mealies, &c. Locusts destroyed oats.

Thibet Park.—Worst drought ever experienced in this part. Water failing everywhere.

Kokstad.—Country parched. Rain badly wanted. Mealie crops are being turned up for want of rain. Weather very changeable; days very hot, nights cold.

TEMPERATURE, DECEMBER, 1904.

Stations.	Mean Max.	Mean Min.	Monthly Means.	Abs. Max.	Date.	Abs. Min.	Date.
Cape Town (S.A.C.)	76·5	57·0	66·8	97·0	30	50·0	27
Simon's Town	75·0	60·4	67·7	90·7	30	55·0	27
Blaauwberg	71·7	56·1	63·9	85·0	30	51·0	3 & 14
Sea Point	74·4	57·3	65·8	96·0	31	50·6	3
Groot Constantia	71·9	55·4	63·7	87·0	31	50·0	27
Wynberg	74·9	56·3	65·6	90·0	30	48·0	22
Robertson (Plantation)	73·8	54·7	64·2	103·0	5	42·0	2
Worcester	82·8	54·1	68·5	96·0	5	46·0	26
„ (Hug. Sem.)	81·4	58·0	69·7	97·5	30	46·5	23
Elsenburg	76·5	53·3	64·9	95·5	30	43·1	3
Groot Drakenstein	79·9	56·3	68·1	97·4	31	43·1	27
Ceres	79·5	51·6	65·5	100·0	31	42·0	3
O'okiep	82·1	56·0	69·1	100·0	30	42·5	2
Hopefield	84·0	52·5	68·2	105·0	28	43·0	2
Cape L'Agulhas	70·6	58·6	64·6	75·0	31	51·0	23
Dunbrody	84·9	53·6	69·2	106·0	31	41·7	15
Concordia	73·1	54·6	63·8	91·0	31	47·2	3
Van Staaden's River	74·5	55·0	64·7	93·0	17	46·3	12
Uitenhage	81·2	55·9	68·5	100·0	31	46·5	15
Storms River	75·9	53·1	64·5	99·0	31	43·0	3
Cape St. Francis	70·7	58·7	64·7	79·0	17	49·0	22
Heidelberg	80·1	56·5	68·3	96·0	5	42·0	3
Port Elizabeth	72·6	59·5	66·1	86·5	17	53·0	31
George	73·2	54·4	63·8	90·5	31	48·5	2 & 3
Somerset East	81·8	51·1	66·4	99·2	31	42·0	15
Murraysburg	80·4	52·2	66·3	94·0	31	43·0	29
Wagenaar's Kraal	80·1	50·5	65·3	94·0	31	40·7	15
Hanover	80·8	47·7	64·3	89·0	6	37·0	3
Kimberley	88·9	56·6	72·8	96·1	28	47·1	14
Kenhardt	88·8	60·1	74·4	102·0	31	51·0	22
Hope Town	87·2	56·9	72·1	95·2	31	44·0	14
Lovedale	83·9	56·3	70·1	101·0	5	46·5	15
East London	72·7	60·8	66·7	80·0	5	47·0	14
King William's Town	84·4	56·5	70·4	101·0	10	48·0	2
Port St. John's	78·0	61·7	69·9	84·0	9	55·0	4
Sydney's Hope	75·3	53·2	64·3	98·5	31	44·8	3
Bedford	81·0	51·6	66·3	99·0	6	38·0	15
Grahamstown	77·3	50·9	64·1	99·8	31	39·8	3
Stutterheim	76·9	52·7	64·8	94·5	5	41·0	2
Aliwal North	82·0	51·5	66·7	89·5	10	44·0	3
Queenstown	83·6	52·8	68·2	96·0	31	44·0	14
Rietfontein (Aliwal North)	79·8	50·4	65·1	87·2	10	37·1	14
Mount Ayliff	78·4	54·2	66·3	95·0	10	40·0	14
Matatiele	77·8	51·1	64·5	88·5	25	37·0	15
Umtata	79·0	55·4	67·2	93·0	5	45·0	3
Main	77·9	52·4	65.1	95·0	10	42·2	3
Moyeni	88·4	49·4	68·9	97·0	31	37·0	14
Mohalies Hoek	81·6	49·3	65·4	89·0	11	41·0	30
Carisbrook (O.R.C.)	83·6	54·1	68·8	101·5	9	45·0	15
Kuruman	84·1	55·1	69·6	93·0	31	48·0	14
Gwanda	86·2	61·9	74·0	101·5	25	53·5	4
Hope Fountain	78·5	58·5	68·5	93·7	29	50·8	25
Means	79·2	54·9	67·0	94·3	..	45·2	..
Extremes	..	..	..	106·6	31	32·0	3, 14 & 15

RAINFALL, DECEMBER, 1904.

I. CAPE PENINSULA:

	INCHES
Royal Observatory, (*a*) 12 inch gauge	1·51
Cape Town, Fire Station	0·79
Do South African College	1·45
Do Sea Point (Hall)	0·47
Do do. (Attridge)	0·48
Do Molteno Reservoir	1·93
Do Platteklip	2·81
Do Signal Hill	0·49
Table Mountain, Disa Head	1·98
Do Kasteel's Poort	2·92
Do Waai Kopje	5·04
Do St. Michael's	5·05
Bishopscourt	2·25
Kenilworth	1·36
Wynberg (St. Mary's)	0·89
Groot Constantia	1·89
Tokai	1·21
Simon's Town (Wood)	0·95
Do. (Gaol)	1·05
Blaauwberg Strand	0·22
Robben Island	0·24
Camp's Bay	0·76
Fish Hoek	0·46
Cape Point	0·21

II. SOUTH-WEST:

Klapmuts	1·04
Stellenbosch (Gaol)	1·14
Somerset West	0 41
Paarl	1·38
Wellington (Gaol)	1·07
Groot Drakenstein	1·30
Tulbagh	0·24
Kluitjes Kraal	0·74
Ceres	1·37
Caledon	0·20
Worcester (Gaol)	0·08
Hex River	0·00
Robertson	0·46
Robertson (Govt. Plantation)	0·41
Montagu	0 00
The Oaks	0·45
Elgin Plantation	1·47
Elsenburg Agricultural College	0·91

III. WEST COAST:

Klipfontein	0 00
O'okiep	0 16
Springbokfontein (Gaol)	1·18
Concordia	0·55
Garies	0·00
The Towers	0·48
Dassen Island	0·27
Malmesbury	0·14
Piquetberg	0 76

III. WEST COAST—*Continued*

	INCHES
Van Rhynsdorp	0 00
Clanwilliam (Gaol)	0·00
Welbedacht	0·00
Hopefield	0·06
Lilyfontein	0·59
Anenous	0·00
Zoutpan	0·32

IV. SOUTH COAST:

Cape L'Agulhas	0·74
Bredasdorp	1·03
Swellendam	2·58
Heidelberg	1·15
Riversdale	0·76
George	3·83
Millwood	2·82
Sour Flats	1·91
Concordia	4·59
Knysna	2 32
Buffels Nek	5·12
Harkerville	3·10
Plettenberg Bay	3·90
Blaauwkrantz	3·59
Storm's River	4·34
Witte Els Bosch	4·4
Humansdorp	2·62
Cape St. Francis	2·61
Hankey	1·86
Witteklip	2·59
Van Staaden's (upper)	2·93
Do. (lower)	2·40
Uitenhage	2·1
Do (Inggs)	2·14
Dunbrody	0·68
Port Elizabeth (Harbour)	1·26
Lottering	3·88
Shark's Rivier (Nursery)	1·88
Do (Convict Station)	1·59
Grootvader's Bosch	2·10
Karnmelk's Rivier	0·76
Vogelvlei	0·37
Armadale	0·66

V. SOUTHERN KARROO:

Ladismith	0·
Calitzdorp	1·00
Oudtshoorn	0 54
Uniondale	0·50
Kleinpoort	0·6
Glenconnor	0·00
Seven Week's Poort	0·00

VI. WEST CENTRAL KARROO:

Prince Albert Road	0·41
Fraserburg Road	0·06

I. W. C. KARROO—*Continued*

	INCHES
Prince Albert	0·04
Zwartberg Pass	1·65
Beaufort West	0·12
Dunedin	0·00
Camfer's Kraal	0·42
Baaken's Rug	0·25
Willowmore	0·48
Steytlerville	0·60
Krom River	0·15

II. EAST CENTRAL KARROO:

	INCHES
Aberdeen (Gaol)	0·79
Aberdeen (Bedford)	0·86
Rietfontein	0·25
Winterhoek	2·40
Klipdrift, De Erf	0·58
Kendrew	1·68
Graaff-Reinet	2·42
New Bethesda	0·23
Roode Bloem	0·75
Wellwood	0·33
Do (Mountain)	0·06
Jansenville	0·21
Patrysfontein	0·59
Toegedacht	0·30
Klipfontein	0·88
Pearston	0·87
Corndale (Div. Aberdeen)	1·70
Middelwater	0·50
Darlington	0·82
Bloemhof	0·66
Walsingham	0·00

III. NORTHERN KARROO:

	INCHES
Sutherland	0·00
Rheboksfontein	0·00
Fraserburg	0·31
Droogefontein	0·66
Carnarvon	0·57
Wagenaar's Kraal	0·02
Brakfontein	0·24
Victoria West	0·68
Britstown	0·00
Murraysburg	0·49
De Kruis	0·72
De Aar	0·27
Middlemount	0·00
Hanover	0·02
Philip's Town	0·05
Boschfontein	1·15
Petrusville	0·00
The Willows	0·54
Middelburg	0·00
Colesberg	0·37
Tafelberg Hall	0·20
Cradock	0·33
Do. (D/E Office)	1·19
Steynsburg	1·41
Tarkastad	1·42
Riet Vlei	0·57
Varken's Kop	0·11
Doorskuilen	0·00
Hillmoor	0·51

VIII. N KARROO—*continued*

	INCHES
Loxton	0·00
Waverley	0·69
Wildebeestkooij	0·00
Maraisburg	0·00
Gannapan	0·00
Schuilhoek	0·57
Vosburg	0·22
Zwavelfontein	0·72

IX. NORTHERN BORDER:

	INCHES
Kenhardt	0·69
Van Wyk's Vlei	0·43
Prieska	0·36
Dunmurry	0·78
Griqua Town	0·60
Campbell	0·95
Douglas	0·11
Avoco (Herbert)	0·33
Hopetown	0·06
Newlands (Div. Barkly West)	2·52
Kimberley (Gaol)	0·54
Do. (Stephens)	0·55
Bellsbank (Div. Barkly West)	3·50
Barkly West	1·75
Upington	3·17
The Halt	1·20
New Year's Kraal	0·41
Karre Kloof	0·00

X. SOUTH-EAST:

	INCHES
Melrose	0·79
Fairholt	1·04
Cheviot Fells (Bedford)	0·52
Bedford (Gaol)	1·47
Do (Hall)	1·34
Sydney's Hope	0·91
Cullendale	1·44
Adelaide	1·24
Atherstone	0·43
Alexandria	3·57
Salem	1·21
Graham's Town (Gaol)	1·31
Do. (Bact. Inst.)	1·21
Heatherton Towers (near Graham's Town)	0·40
Katberg	1·46
Balfour	0·54
Seymour	0·20
Glencairn	0·61
Lovedale	0·19
Port Alfred	2·53
Hogsback	2·63
Thaba N'doda	2·25
Peddie	1·33
Cathcart	1·89
Keiskama Hoek	1·21
King William's Town	1·05
Do. Hospital	1·52
Stutterheim (Wylde)	0·81
Do (Besté)	0·80
Kubusie	0·50
Blaney	0·54
Evelyn Valley	4·29
Isidenge	1·92

. SOUTH-EAST—*Continued*	INCHES
Perie Forest	2·10
Quacu Forest	1·05
Kologha	1·70
Fort Jackson	1·05
Komgha . .	0·74
Prospect Farm (Div. Komgha)	1·81
East London, West ..	3·57
Fort Fordyce	1·71
Lynedoch	1·04
Sunnyside	1·43
Crawley	0·87
Forestbourne	3·04
Chiselhurst	3·37
Cata	1·96
Wolf Ridge	2·59
Dontsah	1·17

I. NORTH-EAST:

Venterstad	0·10
Ellesmere .	0·25
Burgersdorp	0·30
Molteno Station	0·42
Cyphergat	0·91
Thibet Park	0·56
Sterkstroom ..	0·95
Do (Station) ..	0·53
Rocklands	1·27
Aliwal North (Gaol ..	0·22
Do. (Brown) ..	0·39
Rietfontein	1·01
Hex's Plantation	0·78
Carnarvon Farm ..	2·40
Jamestown . ..	0·00
Queenstown (Gaol) ..	2·04
Do. (Beswick) ..	1·82
Herschel	0·65
Lady Grey	0·60
Bolotwa, Contest	1·41
Lady Frere	1·44
Keilands	1·68
Barkly East	0·63
Lyndene ..	0·10
Mooifontein	0·15
Poplar Grove	1·82
Whittlesea .. .	2·01
Halseton	1·04
Sterkspruit	1·07
Blikana	1·65
Table Hill	1·61
Albert Junction	0·18
Hughenden	0·31
Glen Wallace	1·02

XII. KAFFRARIA:

Slaate, Xalanga	1·73
Ida, Xalanga	1·55

VII. KAFFRARIA—*Continued*	INCHES
Cofimvaba	2·25
Nqamakwe	0·87
Main	2·11
Engcobo	1·82
Butterworth	1·11
Kentani	2·21
Maclear	3·85
Idutywa	0·31
Willowvale	2·05
Mount Fletcher	3·53
Elliotdale	1·33
Mqanduli	1·09
Matatiele	2·69
Umtata	2·06
Kokstad	2·34
Port St. John's	3·68
Umzimkulu	2·42
Woodcliff	3·19
Tabankulu	2·70
Somerville (Div. Tsolo) ..	4·37
Tsomo .. .	2·17
Bazeya	3·52
Qwebe	3·10
Mount Ayliff	1·80
Seteba	2·73
Flagstaff	3·60
Insikeni	4·96
Wanstead	3·86

XIII. BASUTOLAND:

Mafeteng	1·29
Mohalie's Hoek	3·24
Qacha's Nek	1·46
Moyeni Quthing	1·67
Teyatayening	3·19

XIV. ORANGE RIVER COLONY:

Imperani	0·71
Reitz	2·27

XV. NATAL:

Durban, Observatory ..	6·41

XVII. BECHUANALAND:

Vryburg	3·88
Mafeking	1·38
Taungs	3·50
Setlagoli	2·63
Kuruman	2·57
Zwartlaagte	3·08

XVIII. RHODESIA:

Hope Fountain	4·02

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 21st January, 1905, ruling at the several centres named, is published for general information :—

CENTRE.	A. Wheat per 100 lb.	B. Wheat Flour per 100 lb	C. Boer Meal per 100 lb	D. Mealies per 100 lb.	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H. Oat-hay per 100 lb	J. Potatoes per 100 lbs.	K. Tobacco (Boer Roll) per lb.	L. Beef per lb	M. Mutton per lb.	N. Fresh Butter per lb.	O. Eggs per doz	P. Cattle (Slaughter)	Q. Sheep (Slaughter.)
	£ s d	£ s. d	£ s d	£ s. d.	£ s d.	£ s. d.	£ s d.	£ s. d	£ s. d.	£ s d	s d	s d	£ s. d.	s d.		
Aliwal North ...	0 12 0	0 14 0	0 13 6	0 6 6	0 9 0	0 10 0	0 9 0	0 7 6	0 8 0	1,6 to 4/-	0 9	0 9	0 2 6	2 6	£16	26/-
Beaufort West ..	0 11 6	0 17 0	0 13 0	0 9 0	0 12 6	0 10 0	0 8 0	0 4 6	0 5 0	0 0 7	6d to 11d	0 7½	0 1 10	1 7	£18	25/6
Burghersdorp ...	...	...	...	...	...	...	...	0 6 0	0 6 6	...	...	0 10½	0 3 0	1 6	...	...
Cape Town ...	0 9 9	0 12 4	0 10 0	0 6 9	0 8 3	0 6 0	0 5 0	0 3 5	0 5 0	0 0 8	0 10	0 10	0 1 6	1 9	£16 to £20	25/-
Clanwilliam ...	0 10 0	1 5 0	0 11 6	0 10 0	...	0 7 6	0 8 0	0 3 0	0 10 0	0 4 6	0 8	0 7	0 1 6	1 3	...	22/6
Colesberg ..	...	...	...	...	...	...	...	0 7 6	0 10 0	...	...	...	0 2 0	1 9	...	...
Cradock ..	...	...	...	...	...	...	...	0 8 0	0 6 6	...	...	0 9	0 2 0	2 1	...	...
Dordrecht ..	...	0 15 6	0 13 6	0 9 0	0 10 0	0 12 0	0 10 0	0 12 0	...	0 1 0	0 9	0 8	0 2 0	1 6	...	...
East London ...	0 13 0	0 15 6	0 13 6	0 7 0	0 10 6	0 8 0	0 11 6	0 7 6	0 12 0	0 1 6	1 1	1 1	0 3 0	2 3	£22	33,6
Graaff-Reinet ..	0 11 6	0 15 6	0 12 6	0 9 0	...	0 7 6	0 9 0	0 6 0	0 9 0	0 0 6	0 7	0 7	0 1 9	1 6	£12 10s.	22/-
Graham's Town	...	...	...	0 8 6	...	0 6 0	...	0 4 6	0 6 9	...	0 8	0 9½	0 2 1	1 10	...	...
Kimberley ...	0 11 6	0 16 0	0 13 0	0 7 0	0 8 0	0 7 6	0 7 0	0 5 6	0 14 0	0 0 6	0 10	0 8	0 1 9	1 6	£13 to £15	23/- to 26,-
King Wm's Town	0 8 0	0 15 0	0 13 0	0 7 0	0 8 0	0 8 0	0 8 6	0 7 0	0 9 0	0 0 6	0 8	0 8	0 2 9	1 6	...	...
Malmesbury ...	0 8 6	0 12 6	0 10 6	0 6 3	...	0 7 0	0 6 6	0 3 0	0 8 1	0 1 0	0 9	0 8	0 1 3	1 3	£16 10s.	25/-
Mossel Bay ...	0 10 0	0 15 0	0 18 0	0 8 0	...	0 4 0	0 6 0	0 2 6	0 8 0	0 1 0	0 9	0 9	0 1 6	1 6	...	...
Port Alfred ...	0 13 6	0 18 0	0 15 0	0 9 0	0 15 0	0 8 0	0 8 0	0 2 0	0 6 0	0 0 9	0 9	0 9	0 2 6	1 3	...	...
Port Elizabeth .	0 10 0	0 12 0	0 7 0	0 7 0	...	0 3 9	0 6 6	0 1 0	0 5 6	...	0 5	0 9	0 2 0	2 0	£20	30/-
Queen's Town ...	0 8 3	0 12 6	0 12 0	0 6 6	0 9 0	0 8 0	0 6 6	0 6 0	0 9 0	0 2 0	0 10	0 9	0 2 3	2 0	£10 to £15	23/6 to 26,6
Tarkastad ...	0 12 0	0 13 6	0 12 6	0 12 0	0 12 0	0 11 0	...	0 8 6	0 10 0	0 1 6	0 8	0 8	0 2 6	1 6	£15	29/-
Vryburg ...	0 13 0	0 18 6	0 15 6	0 7 6	0 10 0	0 11 0	0 7 0	0 6 0	0 8 0	0 0 10	0 10	0 9	0 1 6	1 0	£16 10s.	30/-
Worcester ...	0 9 0	0 13 6	0 10 6	0 8 6	0 9 6	0 5 6	0 5 6	0 3 3	0 4 6	0 0 8	0 8	1 1	0 1 2	...	...	...

NOTE.—A blank space denotes "no transactions."

DEPARTMENTAL NOTICES.

Quarantine Regulations for Cattle and Sheep Introduced from Argentina, &c.

The following Regulations framed under the Animals Diseases Act have been gazetted by Proclamation No. 408, 1904, to apply to the introduction and importation into the Colony of Cattle and Sheep from Argentina, Uruguay, &c.:—

1. For the purpose of these regulations the term "Stock" shall be held to mean horned cattle, sheep and goats.

2. The importation will be allowed only through the port of *Cape Town*.

3. The stock on arrival at the Port shall be inspected by a Government Veterinary Surgeon, and, if passed, shall be permitted to be landed, under the supervision of a Harbour Board Officer, and at the risk and expense of the importer, into sheds at the South Arm, Alfred Docks, where it will be quarantined for a period of four days, at the importer's expense.

4. All stock so landed must be accompanied by a Certificate in the subjoined form "A."

5. All Cattle so landed must in addition, be accompanied by a Certificate in the subjoined form "B," and, unless intended for immediate slaughter, by a further certificate in the form "C."

6. All cattle not intended for immediate slaughter, and unaccompanied by such certificate "C" may, nevertheless, be landed, but must be submitted to the *Tuberculin* test at the Quarantine Station, and any which re-act thereto shall be slaughtered forthwith.

7. Should any appearance of infectious or contagious disease be discovered by the Veterinary Inspector amongst the live-stock on board any vessel on her arrival in the Bay, such live-stock will not be allowed to be landed alive, but must be slaughtered on board either the same vessel or any other vessel to which it may be permitted to be transferred. The carcases, however, after being properly dressed on board and after the removal of any affected organs, such as the heads and feet, may be allowed to be landed. The offal and all diseased parts or organs must be taken out to sea, properly weighted under the direction of a Harbour Board Officer, and thrown overboard at a spot indicated by the Port Authorities

The hides and skins of all stock slaughtered in the Bay will not be allowed to be landed, until they are disinfected to the satisfaction of the Government Veterinary Surgeon.

No litter, manure, or hay of any kind, shall be thrown overboard in the Bay; these articles must be either consumed by fire on board or taken out to sea and disposed of in the same manner as the offal, &c.

8. No loose hay, or hay stored on deck, shall be allowed to be landed from any vessel carrying live-stock amongst which any infectious disease has appeared; but hay properly baled and stored in closed hatches which have not been opened during the voyage may be allowed to be landed, if the Veterinary Surgeon is satisfied that there has been no communication between such closed hatches and the other parts of the vessel during the voyage.

9. Should any appearance of an infectious or contagious disease manifest itself at any time amongst such imported live-stock while in quarantine, the whole consignment must be slaughtered forthwith in the sheds provided for the purpose, and the diseased organs, offal, blood, manure, litter, hay, &c., disposed of in the manner set forth in paragraph 7.

10. After each day's slaughtering the importer must clean up the slaughter-house, and place all hides, offal, fat, etc., in the proper receptacles for their removal, to the satisfaction of the Government Officer.

11. All carcases must be removed from the cooling-room, together with all hides, offal, fat, etc., within 15 hours of the termination of each day's slaughtering.

12. Should no indication of disease be discovered amongst such stock during the period of quarantine, they shall be exempt from further detention, and may be removed by rail, to any place within the Colony.

13. All slaughter stock intended for removal from the Station shall be branded with a Government mark S, to signify that it is intended for slaughter only.

14. All provender shall be supplied by the importer, and stock in pens in quarantine, or awaiting slaughter, is to be fed and watered by the importer, who must also arrange for the cleansing of the pens and the removal of all offal, etc., into trucks, at the close of each day, to the satisfaction of the Officer appointed by Government.

15. All loading of stock from the pens to the train must be performed by the importer.

16. The importer will be required to pay the Dock dues, &c., imposed by the Table Bay Harbour Board and, in addition, a special charge of 1s. 6d. per head for Horned Cattle, and 3d. per head for Sheep and Goats landed into the sheds at the Quarantine Station.

CERTIFICATE "A."

I do hereby certify that the undermentioned Stock is free from disease, and has come from an area which is free from Epizootic Aphtha (Foot and Mouth Disease), and also from other contagious or infectious disease of Stock.

Number and general description of Stock ....

Place from which Stock has come ....

Name of Consignee ....

Signature..............................
Title..............................
Place..............................

Date..................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the Stock is shipped.

CERTIFICATE "B."

I do hereby certify that the undermentioned cattle are free from disease, and have not come from a locality in which the disease known as Redwater, Texas Fever, Tick Fever or Tristeza is indigenous, and in which healthy cattle from non-infected areas are liable to become infected with the said disease.

Number and general description of the Cattle ....

Place from which Cattle have come ....

Name of Consignee ....

Signature..............................
Title..............................
Place..............................

Date..................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the cattle are shipped.

CERTIFICATE "C."

I hereby certify that the undermentioned cattle, branded with the sign T, have been submitted by me to the Tuberculin Test, and, not having re-acted thereto, I consider them free from Tuberculosis.

Number and general description of Cattle ....

Place from which Cattle have come ....

Name of Consignee ....

Signature..............................
Title..............................
Place..............................

Date..................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the cattle are shipped.

Railway Rebate upon Carriage of Cement, &c., used in Sheep or Cattle Dipping Tanks.

It is hereby notified that from and after December 24, 1904, and until further notice, a rebate will be given, under the following conditions, upon the carriage paid for cement, &c., carried over the Cape Government Railways, and used in the construction of sheep and cattle dipping tanks.

CONDITIONS.

1. The whole of the material comprised in any consignment must be employed solely for sheep or cattle dipping tanks.
2. Rebate will be payable only after presentation of a certificate in the annexed Form A, declared to by the applicant in the presence of the Resident Magistrate of the Fiscal Division within which the dipping tank is situated.
3. The rebate will be applicable only to cement and such other materials as may in the discretion of the Government be admitted from time to time as necessary for the construction or enlargement of any dipping tank.
4. The rebate under these Regulations will be the difference between the South African produce rates (classified "C") and the normal or ordinary Cape Government Railway rates as specified from time to time in the Railway Tariff Book for the carriage of the materials above specified, and of such additional items as may hereafter be added.
5. Applications for rebate must be addressed to the Under Secretary for Agriculture, accompanied by the Railway receipts for carriage paid and by the required declaration on Form A.
6. For facilitation of the subsequent adjustment of any applications under these Regulations, it is recommended that consignors should hand in at the despatching station Consignment Advice Notes on Form B.
7. The Government reserves to itself the right of accepting or declining to admit any application under these Regulations, but no application shall be admitted when the applicant is the recipient of other aid from Government in respect to the construction of dipping tanks, and any decision in this respect must be accepted as final.
8. Copies of these Regulations and of the Forms A and B will be obtainable from all Civil Commissioners or from the Agricultural Department.

FORM A.

REBATE OF RAILWAY CARRIAGE UPON CEMENT, ETC., USED FOR SHEEP OR CATTLE DIPPING TANKS.

APPLICANT'S DECLARATION.

Division of ....

I, ...

of ....

Ward .... Division ....

hereby certify and solemnly and sincerely declare that I am not the recipient of any Government aid, either directly or indirectly, in the construction of Dipping Tanks, and that all the materials specified in the accompanying railway receipt (or receipts) for carriage paid have been actually used in the construction of the dipping tanks described below, and that they are permanently embodied therein; that the tanks have been constructed solely for the purpose of dipping sheep or cattle, and that I have no intention of removing any of the said materials for use elsewhere. I hereby accept and undertake to be fully bound in every respect by the conditions published under Government Notice No. 1366 of 24th December, 1904, and should the Government at any time depute any person for the purpose of making an inspection of the works to which this application applies, I undertake to allow him free access to the work and to all appliances and undertakings connected therewith, and hereby agree to afford him every assistance in determining the manner in which the material has been utilised, and in all other respects to render all reasonable facilities and supply any information required I make this solemn declaration conscientiously believing the same to be true and correct in all particulars.

Signature of Applicant

Date

Declared before me

this day of 190

Resident Magistrate

DESCRIPTION OF WORK

1 Name of Division in which work is situated

2 Name of Ward in which work is situated

3 Name of Farm on which work is situated

4 Approximate distance of site of work from nearest Railway Station

miles

FORM B

REBATE OF RAILWAY CARRIAGE UPON CEMENT ETC, USED IN CONSTRUCTION OF SHEEP OR CATTLE DIPPING TANKS

CONSIGNMENT ADVICE NOTE

Under Government Notice No 1366 of
24th December, 1904

To the

Please take notice that I have this day consigned from

Station to Station, on account of

of in the Division of

the materials (or articles) specified in the subjoined schedules

Application for rebate under Government Notice No 1366 of 1904 will be made in respect of this consignment in due course

(State capacity in which consignee is acting,
e g, as Agent Manufacturer, etc)

Schedule.

Description of Material	Weight	Rate	Total Charges

Inspection of Live Stock arriving by Sea.

Regulations for the inspection of Horses, Cattle, and Pigs arriving from abroad are published for the guidance of both Exporters and Importers, to prevent disappointment upon arrival in this Colony.

HORSES, MULES, OR ASSES (Proclamation No. 173 of 1900).—Glanders.—(1) No horses, mules or asses shall be allowed to enter this Colony by sea, until they have been examined by an Officer, authorised by the Government, to make examinations under the provisions of the "Animal Diseases Act, No. 27 of 1893," and certified by him to be free from Glanders, or any other infectious or contagious disease.

(2) Should the Examining Officer detect the presence of Glanders in any of the animals on board, all such infected animals shall be immediately killed, and their carcasses taken out to sea, sufficiently and properly weighted, and thrown overboard at a place indicated by the Port authorities.

(3) The remaining portion of any such shipment shall be allowed to be landed only on condition that they are removed to a quarantine station, approved of by the Government, and there subjected to a test with mallein by a duly qualified Officer, under direction of a Government Veterinary Surgeon, and detained for such further period as may be necessary.

(4) In the event of the test indicating the existence of Glanders, all animals so shown to be affected shall also be destroyed.

(5) All expenses of inspection, quarantine, destruction, and otherwise, shall be borne by the owner of such animals.

CATTLE (Proclamation No. 75 of 1900).—Tuberculosis.—1. The word "cattle" in these Regulations shall be taken to mean and include all animals of the bovine tribe.

2. No cattle shall be allowed to enter this Colony by sea until the conditions set forth in these Regulations are complied with.

3. If there shall be produced to the Officer authorised by the Government to make the necessary examination of cattle under the provisions of the Animal Diseases Act No. 27 of 1893, a certificate signed by a duly qualified Veterinary Surgeon of the country from which such animals have been brought, to the effect that they have, before being embarked, been submitted to the test known as the tuberculin test, and have not given any reaction indicative of the presence of tuberculosis, and if upon examination the Government Officer shall have reason to believe that they are free from any contagious or infectious disease he shall forthwith give a permit for their landing at any port or place in this Colony.

4. In the absence of a satisfactory certificate as aforesaid the cattle shall be removed to a place provided by the Government for quarantine purposes, and shall be subjected by a Government Veterinary Surgeon to the necessary testing by tuberculin to ascertain whether they are or are not affected with tuberculosis.

5. In the event of the test indicating the existence of Tuberculosis, the animals shall not be removed alive from the quarantine station but shall be destroyed there, and the owner shall be allowed to deal with the carcasses as he may think fit, provided, however, that the flesh shall not be used for human consumption unless the said officer gives a certificate that it is fit for that purpose.

6. All expenses of inspection, quarantine, destruction, and otherwise shall be borne by the owner of such cattle.

7. The foregoing Regulations shall not apply to cattle entering by sea from the Colony of Natal, so long as similar regulations remain in force in that Colony, nor shall they apply to cattle imported solely for purposes of slaughter, provided that, before being landed, they shall be inspected by the officer referred to in the third section of these Regulations and declared to the best of his belief to be not unfit for human consumption, and the owner or importer shall sign and deliver to such officer an undertaking to the effect that none of such animals shall be used or disposed of for any other purpose than for *immediate* slaughter for food.

PIGS (Proclamation 214 of 1903).—The importation of pigs referred to in this Proclamation shall be permitted only upon the following conditions being complied with, namely:—

(a) Before shipment every owner shall obtain a Certificate from a duly qualified Veterinary Surgeon, setting forth that at the time of shipment the pigs are apparently free from the appearance of any contagious or infectious disease.

(b) The consignor shall sign a declaration on oath before a competent legal authority in the country from which export is to take place, to the effect that the pigs have been on the premises from which they are removed, prior to being moved for shipment, for at least 14 days, and that during such period no other pig has been introduced or received into or upon such premises, that the pigs are not affected with swine-fever, that they are not moved out of a swine-fever infected place or area, and further that the movement is not prohibited by any provision of law then in force in the country, state or territory from which such movement takes place.

(c) The Certificate and declaration hereinbefore referred to shall be delivered to any person authorised by the Government of the Colony of the Cape of Good Hope to make the examination required by the "Animal Diseases Act, No. 27 of 1893."

(d) Pigs which may arrive at any port or place in this Colony unaccompanied by the abovementioned certificate and declaration, will not be permitted to be landed, except at Cape Town, Port Elizabeth and East London, where arrangements for quarantine exist.

(e) Such quarantine as is in the foregoing section referred to shall not be for a less period than 28 days from the date of embarkation.

(f) Pigs, which may be found to be infected with swine-fever on arriving at any Port or place in the Colony, or which have been in contact during the voyage with pigs so affected, shall be dealt with in such manner as the Government may direct.

Regulations for Introduction of Cattle from Orange River Colony.

The following proclamation No. 217 of 1903 is published by command of H.E. the Governor.

Under and by virtue of the powers and authorities in me vested by the "Animal Diseases Act," No. 27 of 1893, and by the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare, and make known that, notwithstanding anything contained in Proclamation No. 139, bearing date the 15th day of August, 1901, it shall and may be lawful, [illegible] and after the date hereof, to introduce horned cattle into this Colony from the Orange River Colony, subject to the Regulations contained in the Schedule hereto.

Schedule to foregoing Proclamation.

(1) The person in charge of the horned cattle introduced under this Proclamation shall obtain and have in his possession a certificate in the form set forth in Annexure

“A” hereto, issued and signed by the Resident Magistrate or Special Justice of the Peace of the District in the Orange River Colony from which the cattle have come.

(2) The person in charge of such cattle is liable to be called upon to produce the certificate aforesaid to any Field-cornet, Justice of the Peace, Police Officer, or owner of land over which the cattle may pass or be passing.

(3) Any person who shall contravene any of the provisions of these Regulations shall, upon conviction, be liable to a fine, not exceeding Fifty Pounds Sterling, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding Three Months, unless such fines be sooner paid.

ANNEXURE “A.”

I do hereby certify that the undermentioned cattle are free from infectious or contagious disease, and have not been in contact with infected animals, or, to the best of my knowledge and belief, come from or through a locality where any such disease is known to exist, viz.:—

Number and general description of cattle. ....
Place from which sent. ....
Owner's name and address. ....
Name of person in charge. ....
Place in Cape Colony to which cattle are being sent. ....
Signature of Resident Magistrate of District in Orange River Colony from which cattle have come. ....
Place. ....
Date. ....

Redwater or Texas Fever.

CATTLE FROM QUEENSLAND, UNITED STATES OF AMERICA AND MADAGASCAR.

REGULATIONS REGARDING THE IMPORTATION OF CATTLE FROM QUEENSLAND UNITED STATES OF AMERICA, AND MADAGASCAR.

1. Cattle from the abovementioned Countries may be landed at the Ports of East London, and Port Elizabeth, subject to inspection and issue of Clean Certificate at such port as provided by law.

2. Such Cattle may also be landed at the Ports of Cape Town and Mossel Bay, provided they are accompanied by a Certificate in the subjoined form.

CERTIFICATE.

I do hereby certify that the undermentioned cattle are free from disease, and have not come from a locality in which the disease known as Red Water, Texas Fever, Tick Fever, or Tristeza is indigenous, and in which healthy cattle from non-infected areas are liable to become infected with the said disease.

Number and general description of cattle.................................
Place from which cattle have come... ....
Name of consignee at Cape Town or Mossel Bay...

* Signature ....
Title .
Place
Date..

African Coast Fever.

PROHIBITION OF INTRODUCTION OF CATTLE FROM SOUTHERN RHODESIA.

By command of His Excellency the Governor the following Proclamation No. 139 1902, is published.

Whereas the disease known as Redwater is prevalent amongst cattle in Southern Rhodesia:

Now, therefore, I do hereby proclaim, declare and make known that, under and by virtue of the powers vested in me by the said Act No. 27 of 1893, the introduction of cattle from Southern Rhodesia into any part of this Colony shall be and is hereby prohibited, and that all cattle which may enter this Colony in contravention of this Proclamation shall be liable to be destroyed.

And I hereby declare that this Proclamation shall have effect from and after the date hereof, and shall continue in force until amended or repealed.

And I do strictly charge every Resident Magistrate, Field-cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Prohibition and Regulation of the Introduction of Live Stock in consequence of African Coast Fever in the Transvaal.

By proclamation No. 202, dated June 29, 1904, the following is enacted:—

It shall not be lawful, from and after the promulgation hereof, to introduce or cause or allow to be introduced into this Colony from any part of the Transvaal any of the following animals, that is to say:—Cattle, horses, mules, asses, sheep, goats, pigs, ostriches, dogs and cats; provided, however, that horses, mules, asses, dogs and cats, may, with the special permission of the Chief Veterinary Surgeon, or his authorised representative, be so introduced at such ports of entry as may from time to time be appointed for this purpose, if accompanied by a Certificate signed by the Principal Veterinary Surgeon of the Transvaal, or his authorised representative, to the effect that they have not come from or passed through any portion of the Transvaal proclaimed or known to be infected with African Coast Fever.

Any person introducing such animals or causing or allowing such animals to be introduced, or permitting such animals to stray into this Colony from the Transvaal shall be deemed to be guilty of contravening the provisions of the Proclamation and be liable to the penalties provided in Act 23, of 1893 (Animal Diseases Act, 1893): and all such animals entering the Colony from the Transvaal in contravention of the Proclamation are liable to be destroyed.

Rinderpest in Natal.

By proclamation No. 242 of August 5, 1904, the introduction of Horned Cattle from Natal to the Transkeian Territories, including Pondoland, is prohibited owing to the presence of Rinderpest in Natal, except through the following ports of Entry, viz., Riverside Drift, Border Gate, Umzimkulu Drift and Stanford Drift, district of Umzimkulu, and Middle Drift, Pondoland. They must then be accompanied by the following certificate:—

I hereby certify that the undermentioned cattle are free from infectious and contagious disease, and have not been in contact with infected animals or come from a locality where any such disease shall be known to exist.

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* To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the country from which the cattle are shipped

Number and general description of cattle and place from which sent.................. ....

Owner's name and address...... ....
Name of person in charge... . ...
Place to which cattle are being sent.................. ....
Signature of Official of Natal Government....................................... ....
Title ....
Place.................. ....
Date.. .

Any horned cattle introduced in contravention of this proclamation are liable to be destroyed.

Rinderpest.

By command of His Excellency the Governor, the following Proclamation No. 85, of 1903, is published:—

Under and by virtue of the powers in me vested by the "Animal Diseases Act," No. 27 of 1893, and the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare and make known that, whereas the disease known as Rinderpest has appeared amongst cattle in the British Bechuanaland Protectorate, it shall not be lawful, from and after the date hereof, to introduce or to cause or allow Horned Cattle to be introduced into this Colony from the British Bechuanaland Protectorate.

And I do hereby further proclaim and make known that all Horned Cattle which may enter this Colony in contravention of the Proclamation shall be liable to be destroyed.

Swine Fever.

In view of the appearance of Infectious Swine Fever the symptoms of the disease are hereunder described for general information.

Any case coming to the notice of the Public should be at once communicated to the Resident Magistrate of the District in which the disease has occurred.

SYMPTOMS.

The symptoms of swine fever are not very distinct or specially characteristic at the commencement of the attack, or even during its course, except in acute cases.

The affected animals present a dull and dejected appearance, they move about very quietly and manifest a strong tendency to huddle together. If there is loose soil, manure, or litter available they will crowd together in that.

Their appetite is diminished, and although many of them continue to take a fair amount of food, until they become very bad, they eat in a languid and indifferent manner. Their temperature rises from about 105 to 106 degrees Fahrenheit. In one the temperature registered was 108·4, but it was hustled about a good deal in catching it, which may have raised its temperature a little.

The breathing is slightly quickened, but the increase in the respirations depends upon the extent of the lung lesions. There is also a cough, which is very much aggravated when the pigs are driven about in a kraal. In many cases the cough is the first indication of the infection. There is a hoarseness about the voice in advanced cases.

In an acute attack the pigs fall off in condition very rapidly and manifest a weakness about the hind quarters which makes them walk with a wobbling staggering gait. As the disease advances the listlessness increases and the hind quarters may become semi-paralysed.

The bowels are usually slightly constipated at the commencement, but diarrhœa generally supervenes towards the end.

The progress of the disease is very variable; in some acute cases it runs its course in two or three days, terminating fatally, while in others it may last much longer, but there has not been sufficient time to speak definitely of the course of the disease here yet.

In a number of cases there is more or less of a pink red discolouration of the skin. This does not usually occur until the disease is at its height, and in many cases there is no appearance of discolouration of the skin observable. When present the parts most affected are under the surface of the neck, the breast and the abdomen; the inside of the thighs and the ears. In acute cases these patches of discolouration extend and coalesce and assume a darker hue, the whole surface of the skin being more or less affected. In such cases the skin after death assumes a dark livid hue.

REMOVAL OF SWINE FROM THE DISTRICTS OF CAPE, STELLENBOSCH, PAARL AND MALMESBURY.

By proclamation No. 181, of June 10, 1904, swine are allowed to be removed out of he above divisions provided a permit for such removal be first obtained from the Chief Veterinary Surgeon.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice in Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from a contagious or infectious disorder, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and, in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to the Chief Veterinary Surgeon, Cape Town (telegraphic address: "Veterinus," Cape Town), the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the reatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residences or nearest Railway or Post Cart Station.

D. HUTCHEON,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 24th June, 1904.

Stations	*Names of Veterinary Surgeons.*
Aliwal North	H. T. Armstrong, M.R.C.V.S.
Cape Town	W. G. Pakeman, M.R.C.V.S.
"	S. Elley, M.R.C.V.S.
East London	R. W. Dixon, M.R.C.V.S.
Elsenberg	R. Paine, M.R.C.V.S.
Fort Beaufort	J. F. L. Lyons, M.R.C.V.S.
Grahamstown	T. Bowhill, F.R.C.V.S.
Kokstad	W. A. Hutchence, M.R.C.V.S.
Knysna	J. A. Robinson, M.R.C.V.S.
Malmesbury	C. Goundry, M.R.C.V.S.
Molteno	W. H. Chase, M.R.C.V.S.
Somerset East	J. D. Borthwick, M.R.C.V.S.
"	J. Spreull, M R.C.V.S.
Uitenhage	G. W. Freer, M.R.C.V.S.
Vryburg	J. Neill, M.R C.V.S.
Worcester	A. Goodall, M.R.C.V.S

Farmers' Apprentices, Dairy Assistants, &c

As inquiries are from time to time received from young men from abroad as to where they may serve apprenticeship or gain practical experience of farming in this Colony, before starting on their own account, the Secretary for Agriculture invites Farmers who are willing to receive young men of good character, for this purpose, to register their names with the Under Secretary for Agriculture, stating the class of farming they do, how many young men they are prepared to take, and for what period they would enter into an agreement.

It is not probable that these young men will be in a position to give more than their free services in return for the experience they will gain; that is, they will not be able to pay any fee; and they will look to receiving free board and lodging in return for their services.

Young men who are willing to engage themselves as Farmers' Apprentices in Cape Colony should register their names with the Under Secretary for Agriculture, Cape Town. The apprentice will gain experience in farming in South Africa, and have an opportunity for spying out the land before starting on his own farm.

It will be noted that the Apprentice will neither receive wages, nor pay a fee. He will get free board and lodging in return for his services, and at the same time acquire the experience he is in need of.

Applications for the services of Lady Dairy Experts and Dairy Assistants may also be made to the Under Secretary for Agriculture.

Importation of Trees, Plants, &c.

IMPORT REGULATIONS.

The following Regulations are gazetted under Proclamation No. 138, 1904, to take effect from September 1, 1904, all other regulations being cancelled.

1. The introduction into this Colony of trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs, and of fruit of all kinds, grown elsewhere than in South Africa is prohibited, save and except by sea through the Ports of the Colony or by Post.

2. The importation of the following articles is hereby absolutely prohibited:—

(*a*) Grape vines or any portion or fruit of any grape vine, with the exception of vines or portions thereof imported by the Government under such precautionary measures as it may deem necessary.

(*b*) Coffee plants or any portion thereof, with the exception of seed.

(*c*) Eucalypt plants or any portion thereof, with the exception of seed.

(*d*) Coniferous plants or any portion thereof, with the exception of seed.

(*e*) Stone-fruit trees or any portion thereof, including seeds, that were grown or produced in any State, Province or Territory of the United States of America or the Dominion of Canada (or in any other country, in which either of the diseases known as Peach Yellows or Peach Rosette is found or reported to exist.

(*f*) Peach stocks and peach stones from any country whatsoever.

(*g*) Timber with the bark on, except scaffolding poles shipped from the Baltic Sea or from Canada.

3. The importation of any tree or portion thereof, with the exception of fruit, seed, seedling stocks of fruit trees for budding or grafting purposes, and blight proof stock for apples, shall be allowed only by special permission from the Minister for Agriculture. No permit shall be granted for the introduction of more than ten trees or one hundred cuttings of any one variety, nor shall permits be issued for more than an aggregate of one hundred trees or one thousand cuttings to any party during one year. For the purposes of this clause the term "tree" shall include any plant of the nature of a tree excepting garden shrubs. In case of dispute as to whether any plant falls under this restriction, the decision of the Minister shall be final.

4. All trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs and fruit of all kinds and their packages, cases, pots or other coverings, shall, before being delivered to the consignees, undergo an examination by an officer, appointed for that purpose to determine, as far as possible whether or not insects or plant diseases are present; and it shall be the duty of the consignees or his duly appointed agent to open the coverings and to afford every facility to the examining officer during the examination.

5. All trees and woody plants, together with their covering and packing material, shall as a precautionary measure against the introduction of injurious insects be fumigated at the expense of the consignee in the manner prescribed by and to the satisfaction of the examining officer; and if the examining officer deems the treatment expedient, he may extend it to all other plants and all parts thereof.

6. Should any article, in the examination provided for in Clause 4, be actually found to be infested in whole or in part with any insect or plant disease, the introduction of which would be prejudicial to the interests of the Colony, it shall, together with all other articles in the same receptacle, with all covering and packing material, be cleansed or disinfected by the consignee, or at his expense, in the manner prescribed by and to the satisfaction of the examining officer; and if not so cleansed or disinfected, or if any treatment at command shall be deemed by the examining officer, or found by him, to be inefficient for the absolute eradication of the insect or disease, or if the examining officer knows the insect or disease to be of specially dangerous character, the articles shall be destroyed without delay

7. Ordinarily, the inspection, and other treatment of consignments imposed by these Regulations, shall take place on the premises provided for the purpose by the Government at the port of entry; but special arrangements may be made with the Minister for Agriculture for the execution of all the provisions of Clauses 4, 5, and 6 on the premises of the consignee, when approved facilities, inclusive of a proper fumigation chamber are there provided.

8. On the examining officer being satisfied with respect to a consignment that all the Regulations and conditions herein set forth have been fully complied with, he shall issue a certificate to that effect to the consignee; and before the issue of such certificate the consignment shall be under his control for the purposes of these Regulations

9. Articles subject to examination under these Regulations introduced into the Colony by post shall be intercepted and examined by an officer appointed for the purpose. and if found infected with any noxious insect or plant disease, shall be destroyed or cleansed at the discretion of such examining officer, and if requiring fumigation shall be so treated. All expenses of treatment shall be borne by the addressee.

10. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these Regulations, or from any process that may be considered necessary to cleanse or disinfect the articles, or to discover the existence or otherwise of any insect or plant disease.

11. These Regulations shall not apply to any consignment imported in bond for places beyond the borders of the Colony; nor to canned, dried or otherwise preserved articles in which there is no longer any plant life, with the exception of timber with the bark on

Prohibition of the Importation of Grass Hay from Southern Rhodesia.

By Command of H.E., the Governor, the following Proclamation, No. 166, of September, 10th, 1902, is published in the *Government Gazette*:—

Under and by virtue of the powers and authorities vested in me by Act No. 9 of 1876, intituled "Act to regulate the introduction into this Colony of articles or things which by reason of disease or otherwise might be injurious to the interests thereof," I do hereby proclaim, declare and make known that whereas the infection of Redwater may be conveyed by means of Grass Hay, the importation of Grass Hay from Southern Rhodesia, or from the Bechuanaland Protectorate, shall be and is hereby prohibited; and that all Grass Hay which may enter or be introduced into the Colony in contravention of this Proclamation shall be liable to be destroyed.

And I do hereby declare that this Proclamation shall have effect from and after the date of publication hereof, and shall continue in force until amended or repealed.

And I strictly charge every Resident Magistrate, Field Cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Tobacco Seed.

A small consignment of the undermentioned varieties of Tobacco Seed has just been received from America, and is available for disposal, at the prices quoted:—

White Burley, Yellow Oronoko, Virginia One Sucker, Virginia Pryor, Blue Pryor and Maryland at 6d. per oz.

Connecticut Seed Leaf at 4d. per oz.

Long Leaf Gooch at 7d. per oz

Havana at 8d. per oz.

Sumatra at 1/7 per oz.

The seed will be distributed in lots not exceeding 3 oz. of each variety, and applications, accompanied by a remittance for the amount due, must be addressed to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received.

Australian Salt Bush Seed

It is notified for the information of Agriculturists that about 500 lbs. of Salt Bush Seed recently imported by this Department from New South Wales may be obtained in quantities to suit purchasers at 1s. 9d. per lb. (being one-half the cost of importation) upon application to the Under Secretary for Agriculture Cape Town. Applications will be dealt with in the order in which they are received, and must be accompanied by a remittance to cover cost (either Bank Draft, Postal Note, P.O. order or Cash.)

Guano.

It is hereby notified for general information that Guano Depots have been established at the following Railway Stations, viz.:—Malmesbury, Moorreesburg, Kalabaskraal, Piquetberg, Caledon, Paarl and Worcester, and that *Ordinary* guano from the Government Islands is obtainable thereat on payment to the local Station Masters of the price, viz.:—£6 10s. per ton of 2,000 lbs. or 13/- per bag of 200 lbs.; in addition to the charge for rail carriage from Cape Town. A bag of 200 lbs. is the smallest quantity supplied.

Applications accompanied by remittance for *Rock* Guano, for use within the limits of the Colony, the price of which is £6 17s. per ton of 2,000 lbs or 13/9 per bag of 200 lbs., delivered at the Cape Town Railway Station, should be made to the Superintendent the Government Guano Islands, Cape Town.

The following is the analysis of the guano:—

	Lime.	Potash.	Nitrogen.	Phosphoric Oxide		
				Soluble in water.	Soluble in citrate solution.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Ordinary..	10·65	2·10	13·33	4·02	9·75	9·81
Rock ..	13·01	2·60	13·67	4·95	13·58	13·91

Returning Sheep from Orange River Colony.

The following regulations are issued under Proclamation No. 393, 1904, with regard to the return of sheep to the Colony from the Orange River Colony:—

1 All sheep introduced into this Colony from the Orange River Colony must either pass through one of the authorised Ports of Entry, viz.: Modder River (Division Kimberley), Honeynest Kloof, Witteputs, Belmont and Ramah (Division Herbert), Petrusville (Division Philipstown), Norval's Pont (Division Colesberg) Bethulie and Odendaalstrom (Division Albert) and Aliwal North (Division Aliwal North) or, if intended for immediate conveyance by rail, may be driven direct to the nearest railway station, from any point on the boundary line, between the Modder and Vaal Rivers.

2. All sheep so introduced must be accompanied by a certificate from a Government Inspector of the Orange River Colony that they are either free from Scab or have been dipped under his supervision. In the absence of such certificate, sheep must be dipped at one of the authorised Ports of Entry.

3. All sheep shall be again dipped on reaching their destination.

4. Any person contravening these Regulations shall upon conviction, be liable to fine not exceeding twenty pounds sterling.

Locust Birds.

In view of the ravages caused by Locusts from time to time, the attention of the Public is called to the necessity for protecting and encouraging the birds known as the Great and Small Locust Birds in all parts of the Colony. These birds are of great use to the Agriculturist, seeing that they prey so largely on locusts and other destructive insects which would otherwise leave the land bare of crops and pasturage.

It must be borne in mind that these birds may not be killed as they are specially protected by Law in all parts of the Colony up to and including 5th February, 1906 (Proclamation No. 44 of 1903), and any person wilfully destroying them is liable to fine or imprisonment.

The attention of Field-cornets, Headmen and of farmers generally is drawn to this matter, and it is urgently desired that everyone will do his best to see that the Locust bird is not shot or molested in any way.

Removal of Cattle, Sheep and Goats from Cape Colony to the Orange River Colony.

By proclamation of His Excellency the Lieutenant-Governor of the Orange River Colony, dated February 3, the introduction of horned cattle, sheep or goats from Cape Colony into the Orange River Colony is prohibited except in accordance with the attached schedule. Contravention of the regulations makes the person liable to a fine of £50 or three months with or without hard labour.

SCHEDULE.

(1) The person in charge of horned cattle, sheep and goats introduced under this notice shall obtain and have in his possession a certificate in the form set forth in Annexure "A" hereto, issued and signed by the Resident Magistrate, Veterinary Officer, Justice of the Peace or Inspector of Sheep of the District in the Cape Colony from which the cattle, sheep or goats have come.

(2) The person in charge of such cattle, sheep or goats is liable to be called upon to produce the Certificate aforesaid to the Inspector of Stock at any of the Ports of Entry mentioned in Annexure "B" hereto, or any Justice of the Peace, Police Officer or owner of land over which cattle, sheep or goats may pass or be passing.

ANNEXURE "A."

I do hereby certify that the herein specified (cattle sheep or goats) are free from infectious or contagious disease and have not been in contact with infected animals, and to the best of my knowledge and belief, have not come from or through a locality where any such disease is known to exist, viz:

Number and general description of (cattle, sheep or goats)..

Place from which sent..

Owner's name and address..

Name of person in charge..

Place in the Orange River Colony, to which cattle, sheep or goats are sent..

Signature of Resident Magistrate, Veterinary Officer, Justice of the Peace, or Inspector of Sheep of the District in the Cape Colony from which (the cattle, sheep or goats) have come.

Place..

Date..

Ports of Entry.—Frere Bridge, Colesberg Bridge, Bethulie Bridge, Norval's Pont Bridge, the farm "Karree Laagte," in the District of Jacobsdal; the farm "Dalton's Pont," on the farm "Welgedraai," in the District of Fauresmith.

Virus for Redwater or Texas Fever.

Virus for this disease is carefully prepared at the Government Bacteriological Institute, Grahamstown, and is supplied on demand to farmers at a cost of 1s. 0d. per dose.

Syringes suitable for this operation are supplied at 24/- each, and spare parts for the syringe can be had to replace those which may become broken.

Vaccine for Anthrax or Meltziekte.

Vaccine for this disease, consisting of two vaccines, a first and a second, is supplied from the Government Bacteriological Institute, Grahamstown, in tubes each containing five doses, at a total cost of 2/6 for the first and second vaccine together.

Syringes for the practice of this inoculation can be had on demand, at a cost of 9s. 0d.

Vaccine for Sponziekte or Quarter Evil.

Vaccine for this disease is supplied from the Government Bacteriological Institute, Grahamstown, at a cost of 2s. 6d. for five doses, which includes both the first and second vaccines.

Syringes for use in connection with this vaccine can be had on demand at a cost of 14s. 6d. each.

Regulations for Trout Fishing.

The following Regulations are issued under the "Fish Protection Act, 1899," by Proclamation No. 2[illegible]7, 1904.—

1. It shall be lawful to fish for trout in the Berg, Breede, Eerste, Hex, and Lourens Rivers, and in any of the Tributaries thereof, and in Princess Vley, in the Cape Division, between the first day of October in any year and the thirty-first day of January in the following year, both days inclusive; and in the Buffalo, Izeli, Keiskama and Kabusie Rivers, and in the Tributaries thereof between the first day of October in any year and the thirty-first day of March in the following year, both days inclusive: provided the following conditions be observed, namely:—

(*a*) That no person shall fish for, capture, pursue, or destroy trout of any variety, without first having registered his name with, and obtained a permit from the Resident Magistrate of any of the following districts, viz.:—Cape Town, Paarl, Stellenbosch, Wellington, Worcester, Port Elizabeth, East London, King William's Town, and Grahamstown.

(*b*) That fishing shall be with rod and line only, and that artificial fly only be used as a lure; no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed; but this shall not be held to exclude the use of a legitimate landing net or gaff for landing the fish caught.

(*c*) That if any trout less than twelve inches in length be caught, it be forthwith returned to the water from which it was taken, with as little delay and as little injury as possible.

(*d*) That the consent of the owner or owners on whose ground it is proposed to fish be first obtained.

(*e*) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government official, or by the owner of the property on which the holder of the permit is fishing.

(*f*) That the permit be not transferable.

2. Riparian owners shall not require to obtain a permit to fish for trout in the open waters on their own property during the fishing season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1 of this Schedule.

3. Any person or persons contravening any of the foregoing Regulations, or any of the conditions thereof, shall be liable, on conviction, to a fine not exceeding twenty pounds sterling (£20) for each offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding three months.

Government Labour Bureau, Riebeek Square, Cape Town.

Men in search of employment, resident in Cape Town or Suburbs, should apply personally at the above Office between the hours of 10 and 12 in the forenoon and 2 and 3 in the afternoon. A list of vacant situations is posted in the window. In country districts applications should be made on the prescribed form which can be obtained at the Resident Magistrate's Office.

Notice to Employers.

The Government Labour Bureau undertake, free of charge, the preliminary selection of Candidates for vacant situations, whether in towns or on farms, in all parts of South Africa, the most minute attention being paid to antecedents and testimonials.

Employers should furnish full particulars of their requirements on the prescribed form whenever a personal visit to the Bureau is impossible.

Forms can, in the Country districts, be obtained at the Resident Magistrate's Office.

All letters and applications for employment or for the services of artisans, labourers, etc., should be addressed to THE DIRECTOR, GOVERNMENT LABOUR BUREAU, RIEBEEK SQUARE, CAPE TOWN.

NOEL JANISCH.
Under Colonial Secretary.

Netting for Fruit Trees.

The Board of Horticulture having decided to continue the importation of fruit tree netting, applications for such netting for the season 1905-1906 will be received by the undersigned not later than the 1st of April.

The Netting is sold per piece. Fly netting about 40 yards long by 70 inches wide, 8s. 6d. Bird Netting about 45 yards long by 13 feet wide, 15s.

C. MAYER,
Secretary, Western Province Board of Horticulture.

Stellenbosch, 3rd Dec. 1904.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal.*

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Fruit Culture; Viticulture and Wine Making; Tobacco Culture; Forestry; Poultry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d.); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy and its Products by D. Hutcheon (2d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); *Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Common Blue Tick (1d.); Cabbage Aphis (1d.); Codling Moth in MadeiraFruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); Hessian Fly † (1d.); Insect Pests, their Origin and Means of Suppression (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d); *Peach Yellows (1d): Pear Slug, Paris Green (1d.); Remedy for Mest-wurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Tampans or Fowl Ticks (1d); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d); The Fowl Tick (3d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Legislation to exclude Plant Pests (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); Fumigation for Scale Insects (1d); Rijs Meeren and Hout Kappers (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.): Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Description of two new Gobiform Fishes (1d.); Description of a new South African Gasteropod (1d.); The Ocean and its Resources (1d); Trout Breeding and Stocking of Streams (1d.); Trout and Carp Breeding (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); Lecture on Fruit Culture (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (2d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (3d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and their treatment (1s.); Horse Sickness (2d.); *Heartwater (1d.); *Liver Disease among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); Transmission of Malignant Jaundice of the Dog by a Species of Tick (1d.); Wool v. Mohair (1d.); Wire Worm in Sheep, Goats and Ostriches (1d.); *International Conference of Sheep Breeders (1d.); The Eye and its Diseases (1d.): Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); Notes on the so-called Paralysis Tick (1d.

Viticulture.

*Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.)

Miscellaneous.

Game Seasons (1d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); Collect on Delivery (1d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.

NOTE.—All those marked with * are obtainable in Dutch and English.

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller reports for the month ending January 23rd .—

Wool.—The best Clips from the Grassveld and Bokveld districts have now been disposed of and the offerings now consist mostly of Karroo and Roggeveld Wools. Something over 1,000 Bales have been disposed of since my last report. The market is keeping up well and may be quoted unchanged. The London sales opened on the 17th inst. and cables report firm market with good competition; this news is somewhat disappointing as an advance had been looked for. The prices realised for our offerings may be quoted as follows:—For good Caledon Long Grease up to 9d, a lot of Swellendam realised 8¾d.; Bokveld fetched very good prices and reached 9⅛d. Roggevelds were in good request and according to yield and quality brought up to 8⅜d.; while one clip of Super Long Light Karroo was sold at 7¾d. Snowwhites showed a good competition, realising for Extra Supers from 1s. 5½d. to 1s. 8¼d.: Ordinary 1s. 3d. to 1s. 5d. and Seconds up to 1s. 3d. per lb. Coarse and Coloured Scoured were sold at 12¾d. and Coloured at 10¼d. per lb. The export of wool of the three principal ports for 1904 were as follows:—East London, 85,647; Port Elizabeth, 74,701 and Cape Town, 16,274 Bales; the first two ports showing an increase, while the exports from Cape Town are about 5,000 Bales below last year.

	s.	d.	s.	d.
Super Long Grass Veld Wool	0	8	0	9
Super Long Karroo Veld Wool	0	6¾	0	7¾
Medium Karroo Veld Wool	0	5	0	6¼

	s.	d.	s.	d.
Short and Inferior ..	0	4	0	5
Wool for Washing ..	0	4½	0	6
Snow-white Super to Extra	1	5½	1	8½
„ Ordinary	1	2	1	5
Fleece Washed ..	0	9	0	10

Mohair.—Reports from Home continue to be satisfactory and a considerable amount of trade has been done in nearly all classes. Mohair fabrics seem to be coming into fashion again and the spinners are looking forward to increased business. Good Mixed Hair may be quoted from 9½d. to 10¾d.; Seconds 7d. to 8½d.; Good Winter 11d. to 11¼d.; Winter Kids from 1s. to 1s. 1d.

	s.	d.	s.	d.
Mohair, Firsts, Summer	0	11	1	0
„ Kids.. ..	1	3½	1	4
„ Seconds ..	0	6¼	0	9¾

	s.	d.	s.	d.
Mohair Winter ..	0	10½	0	11¼
„ „ Kids..	1	0	1	1

Ostrich Feathers.—A fair amount of business has been done. Good quality pluckings meet with a good demand, while common class quality does not excite much competition.

	£	s.	d.	£	s.	d.
Super Primes	10	10	0	35	0	0
Firsts, Ordinary to Super ..	8	0	0	10	10	0
Seconds ..	6	10	0	7	0	0
Thirds ..	3	10	0	5	0	0
Femina (super)	7	0	0	10	10	0
Femina, Seconds to Firsts ..	4	0	0	6	0	0
Byocks (fancy) ..	5	0	0	7	10	0
Long Blacks ..	4	10	0	7	10	0
Medium Blacks	3	0	0	3	10	0
Short to Medium	0	10	0	2	10	0

	£	s.	d.	£	s.	d.
Floss ..	0	5	0	1	10	0
Long Drabs ..	2	10	0	4	10	0
Medium Drabs..	1	5	0	1	15	0
Short to Medium	0	10	0	1	10	0
Floss ..	0	2	6	1	10	0
White Tails ..	1	5	0	1	15	0
Coloured Tails..	0	5	0	1	10	0
Chicks ..	0	1	0	0	2	0
Spadonas ..	0	10	0	4	0	0
Inferior Black & Drabs, Short to Long ..	0	0	6	1	10	0

Skins.—There is a strong inquiry for all classes, prices for Wool Skins being higher.

		s.	d.	s.	d.
Long Wool Skins	..	0	6	0	6½
Short „		0	5	0	5¾
Shorn „	..	0	4½	0	5
Bastards ..	..	0	4½	0	5
Cape Skins ..	each	2	0	2	1

		s.	d.	s.	d.
Cape Skins cut	each	0	0	1	0
Goat Skins, heavy to light ..	..	0	8½	0	10
Sundried ..	..	0	0	0	6½
Angoras ..	..	0	4½	0	5½

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date, January 13:—

Ostrich Feathers.—The market was only moderately supplied this week with the usual average assortment. Competition was active, and all descriptions of Whites, Feminas and Tails were fully ten per cent. dearer, blacks and drabs about five per cent. dearer than they were before the holidays. Stocks are unusually small, and arrivals very limited. Future prospects are considered to be promising, more especially as the quantity is likely to be small for some little time to come. During the year 1904 the total weight of feathers sold on the London Market was 483,000 lbs., realising £792,000, against for 1903:—520,000 lbs, realising £1,054,000.

	£	s.	d.	£	s.	d.
Primes: Extra super				Special Prices.		
Good to super	10	0	0	12	0	0
Whites: Firsts	6	10	0	9	0	0
Seconds ..	4	10	0	5	10	0
Thirds ..	2	10	0	4	10	0
Feminas: Tipped and Grey ..	5	0	0	7	10	0
Seconds ..	2	5	0	4	0	0
Thirds ..	1	7	6	2	5	0
Fancy ..	4	5	0	6	10	0
Tails: White ..	1	7	6	2	10	0
Light ..	1	0	0	1	10	0
Coloured & Dark	0	5	0	0	15	0

	£	s.	d.	£	s.	d.
Blacks: Long..	3	10	0	5	[illegible]	0
Medium ..	1	10	0	2	15	0
Short ..	0	10	0	[illegible]	[illegible]	[illegible]
Wirey ..	0	1	0	0	1	6
Floss ..	0	6	0	1	[illegible]	0
Drabs: Long ..	1	15	0	3	5	0
Medium ..	0	15	0	1	10	0
Short ..	0	2	6	0	6	0
Wirey ..	0	0	6	0	1	0
Floss ..	0	6	0	1	1	0
Spadonas: Light	1	0	0	3	0	0
Dark ..	0	12	6	1	1[illegible]	[illegible]
Chicks ..	0	0	3	0	1	[illegible]

Wool.—There is no change to report in this market, which continues steady. A fair amount of business has been done in the open market at current prices. On the public market yesterday 313 bales were offered, of which 167 bales were sold. Competition was active for all light conditioned parcels, but for heavy and wasty lots there was little demand, and the bulk was withdrawn at low bids.

Snowwhite Extra Superior ..	17½d	19d
Snowwhite Superior ..	16d	17d
Do Good to Superior	14½d	15½d
Do Inferior Faulty	13¼d	14d
Grease, Super Long, well-conditioned, Grassveld grown, special clips	8d	9d
Grease, Super Long, well-conditioned, Grassveld grown ..	7d	8d
Grease, Super Long, well-conditioned Karoo Grown ..	6¾d	7d
Grease, Super Long, well-conditioned, Mixed Veld ..	6d	6½d
Grease, Light, faultless, medium, Grassveld grown.. ..	6d	6½d
Grease, Light, faultless, medium Karroo grown	5½d	6d

Grease, Light, faultless, short Karroo grown	5d	5½d
Grease, Short, faulty and wasty ..	4½d	5½d
Grease, Coarse and Coloured ..	4½d	5d
Scoured, Coarse and Coloured ..	9½d	10½d
Free State Grassveld Grease, long and well-conditioned ..	6½d	7d
Free State medium grown, light, with little fault ..	5½d	[illegible]
Free State short, faulty and wasty .	5d	[illegible]
Free State Karroo grown, long and well-conditioned ..	5½d	6d
Free State medium grown, light, with little fault ..	5d	5½d
Free State short, faulty and wasty ..	4½d	5d

Mohair.—This Market continues very firm, and the old bales now arriving are readily sold at extreme prices. On Tuesday's public Market 82 bales were offered, of which 59 bales were sold at full current rates. The only stock held now is 200 bales of super summer kids.

Kids, superfine ..	1s	4d	1s	6d
Kids, ordinary ..	1s	2½d	1s	3d
Kids, seedy and mixed	0s	9½d	1s	0d
Superior Firsts ..	None offering.			
Ordinary Firsts ..	None offering.			
Long Blue O.R.C. Hair	None offering.			

Mixed Hair ..	0s	9½d	0s	10½d
Seconds and Grey ..	0s	7d	0s	8½d
Thirds	0s	4½d	0s	4¾d
Winter	0s	11d	0s	11½d
Do. Kids ..	1s	0d	1s	1d

Skins.—Sheepskins sold in bundles at 6d per lb.; Pelts at 3½d; Capes, 1s 4½d damaged, 5½d each; Angoras, 5½d, Shorn, 4½d; damaged, 2½d; Goat, 10d; damaged, 5d per lb; Springbok, 8d each. We have just received a cable informing us that Sheepskins have advanced ½d on the London Market.

Hides.—Sun-dried Hides sold this week at 7½d, and for damaged, 5½d; Drysalted 6½d; damaged, 5½d, and Thirds, 3½d.

Horns.—Parcels sold all round at 8½d each.

THE

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All communications should be addressed :

"The Editor, Agricultural Journal, Department of Agriculture, Capetown."

Telegraphic Address: "Bulletin," Capetown.

CONTENTS.

PAGE.

NOTES— 316—322

The Show Season—The Other Shows—Bechuanaland Show Postponed—Seedling Trees for Sale—Distribution of American Vines—The Eastern Province and Codlin Moth—The Cape Horse, A Hint to Breeders—Farmers' Congress—Black Spot in Apples—Reports of Farmers' Meetings—Cattle Dips and Their Value as Destroyers of Ticks—The Suborbital Glands in the Duyker and other Antelopes—The South African Stud Book.

FARM AND VELD—(*Illustrated*) 323—329

Mr W R Southey's Fountains—Soakage from River Beds—The Pasteurisation of Milk—Subcutaneous Emphysema, or Air Under the Skin in Ducks—Causes of Rupture of Air Sacs, or the air Cells of the Lungs—The Indian Buffalo—Preserving Meat on the Farm

"VICTOR DON" (*Illustrated*) ... ... 329—330

EXTRA-TROPICAL FORESTRY, by D. E Hutchins, F R. Met. Soc, Conservator of Forests, Cape Town (*Illustrated*) .. . . 331—340

IRRIGATION IN THE NORTH WEST, by W. B. Gordon (*Illustrated*) ... ... 341—363

THE STELLENBOSCH WINE SHOW ... . 354—365

STELLENBOSCH AGRICULTURAL SOCIETY—THE 1905 SHOW ... ... 366—370

ROBERTSON AND MONTAGU AGRICULTURAL SOCIETY—THE 1905 SHOW ... .. 371—374

SLUITS—THEIR EVIL AND PREVENTION, by G. E. Dugmore (*Illustrated*) ... ... 375—380

WORCESTER AGRICULTURAL SOCIETY—The 1905 SHOW .. .. 381—386

TESTS OF SUBSTANCES FOR TICK DESTRUCTION, by C. P. Lounsbury, Govt. Entomologist ... ... 387—395

RURAL CAPE COLONY, No XI., by F. D MacDermott (*Illustrated*) ... ... 396—405

THE DESTRUCTION OF LOCUSTS, by C. W. Mally, M Sc. (*Illustrated*) ... ... 406—420

THE HOUSING OF MILK COWS ... ... 421—424

THE SALT BUSHES, by Dr. E A Nobbs (*Illustrated*) ... ... 425—432

CAPE TOWN INDUSTRIAL EXHIBITION—GOVERNMENT PRIZES ... ... 433—434

CORRESPONDENCE— 435—448

Chemical Manures for Fruit Trees—Air Chambers on Syphons—The Working of Syphons—Fatal Indigestion in Cattle—Agricultural Salt—Lifting Water for Irrigation—Bars in Ostrich Feathers—Stock Poisoned by Young Kaffir Corn—Lime and Sulphur Dip—Ground-Eating Calves—Sample Specifics for Farmers—Worms in Lambs—"Megrims in a Cockerel"—Fixing Drift Sands—Lime and Sulphur vs Imported Dip—The Working of Syphons—Lambs Dying—Stockholm Tar and Heartwater—Smutting—Causes or Effects?

RURAL REPORTS ... ... 449—452

NOTES ON THE WEATHER OF JANUARY, 1905 ... ... 453—456

RAINFALL RETURNS FOR JANUARY, 1905 ... ... 457—459

CURRENT MARKET RATES 460

DEPARTMENTAL NOTICES ... ... 461—495

DEPARTMENTAL PUBLICATIONS ... ... 496—497

THE PRODUCE MARKET ... ... 498—500

INDEX TO ADVERTISERS ... ... lxiii—lxiv

2

NOTES.

The Show Season.

February has proved an interesting month for agriculturlists in the Western Province, for the series of shows has been a record of progress. It is gratifying to note the steady advance which is being made in most of the leading branches of agriculture as demonstrated by the exhibits, for in spite of unfavourable seasons, the competition in the majority of the sections was good and the display of a very encouraging nature. In this issue we publish a few notes on the district shows held since our last, with lists of the principal prize-winners. The Western Province Show is too big to squeeze in at the end of the month. We can only note in this issue that it was well up to the high standard of past successes, and in some ways surpassed anything previously attempted. The sudden and regretted death of Mr. E. H. F. Mellish cast a gloom over it and the withdrawal of his entries, some 75 in number, made a serious difference in the ranks of pure-bred horses and cattle. The deep regret felt by all at the loss the community has sustained by the death of Mr. Mellish was feelingly voiced by His Excellency the Governor at the judges' luncheon—a sentiment that will be re-echoed wherever the deceased gentleman was known.

The Other Shows.

The Riversdale show is to be held on the 2nd inst., and Ceres on the 8th. There are only four shows in the Eastern section of the Colony. Barkly East is fixed for the 17th inst., the Albany show at Grahamstown on the 30th and 31st, and Port Elizabeth on April 5th, 6th and 7th. The Kokstad show is fixed for the first week in April.

Bechuanaland Show Postponed.

The Secretary of the Bechuanaland Agricultural and Horticultural Society writes, stating that, owing to the drought and the general financial depression, his society has decided not to hold the show this year.

Seedling Trees for Sale.

The Forest Department announces in our business pages that surplus seedlings of several varieties of Eucalypts are now obtainable at 3/- per 1,000. All interested in tree planting should look up the advertisements.

Distribution of American Vines.

Particulars are published among the Departmental Notices this month of the arrangements made for the distribution of American vine cuttings for 1905. Applications must be sent to the local Boards not later than March 31st, inst.

The Eastern Province and Codlin Moth.

The Bathurst Farmers' and Fruit Growers' Association is taking a strong line on the question of a possible invasion of codlin moth. At the last meeting the contentions of the Western Province Growers were adversely and warmly criticised and the resolutions recently passed by the Western Province Horticultural Board on the subject were openly derided. The report of the meeting gives some delightful specimens of oratory which are highly amusing, but, underlying all this, is an evident intent to do all that is possible to keep infected fruit out of their uninfected areas. The Bathurst Orchardists are largely interested in apples and they very naturally view a possible invasion of codlin moth with alarm. The result of the discussion as represented by the resolution adopted is as follows.—"That the Secretary enlist the co-operation of the executive of the Eastern Province Horticultural Board and Eastern Province fruitgrowers generally, and present a strong counter-blast to Government. That each district must recognise the importance of excluding codlin moth from the young plantations at all risks, as a matter of life or death to the industry, and to forward immediately to the E.P.H.B., Box 182, East London, the extent of the planting in each district, together with an estimate of their fruit (apples, etc.) crop, in tons of 2,000 lbs., for the next three years."

The Cape Horse—A Hint to Breeders.

Mr. Hutcheon, the Chief Veterinary Surgeon, speaking at the Robertson Show, said it had given him great pleasure to inspect the Show that day. He had noticed a marked improvement in all classes, especially in horses. Two hopeful features were to be noted: First, the presence of a fine class of brood mares; and, secondly, the number of promising youngsters. The Cape horse, he went on, bears a high character for durability and all-round capabilities; they should take great care therefore, that they do not lose those qualities, but keep as far as possible to the original type. "If I read Colonial history aright," he continued, "I find that the Cape horse reached his highest s age of perfection from about 1820 to 1860. Now what was the ancestry of the Cape horses which were bred during that period? The foundation stock of the Cape horse was of Eastern origin principally, animals possessing a strong strain of Arab blood. The descendants of these are described as hardy animals, but deficient in size, substance and symmetry. At the date referred to, Lord Charles Somerset, and after him, the leading horse-breeders of the Western Province, imported a large number of first-class English thorough-bred horses and it was the progeny of these when mated with the Arab type of Cape mare, that produced the horses—5,000 of which were sent to India during the mutiny—and which were the first, and thoroughly established the character and capabilities of the Cape horse.

"I am well aware that subsequent to this, a large number of weedy thoroughbred horses were imported by speculators, which practically ruined the horse stock of this country, and caused the English thoroughbred to fall into disrepute as a sire. But there is a great danger lest in trying to counteract the evil effects of the weedy thoroughbred, we go to the other extreme. There are two classes of horses that we can profitably produce in Cape Colony; these are—first-class carriage and riding horses, and the all-round serviceable Cape horse, capable of anything. Now, in districts such as Robertson and Worcester you take up horse-breeding us an auxiliary farming pursuit. because you delight in it. This is clearly indicated by the fact that you take the trouble to feed your horses largely on food which has to be specially grown, or purchased for them. It is manifest, therefore, that as a matter of business as well as of pleasure, the horse-breeders of these districts should aim at nothing less than the production of the best riding and driving horses that can be bred. We have already a large number of wealthy men in this country, and I hope their number will continue to increase. Now, one of the first luxuries which a wealthy man desires to possess is first-class carriage horses. But first-class carriage horses which will command the admiration of these men must posess fine symmetry, quality and action. Any breeder who has a well-matched pair of such horses to dispose of at the present time can command his own price for them.

"Now the question arises, how are such horses to be bred? I have already remarked that you have a valuable foundation stock in the large number of good brood mares, which have been shown here to-day—they only require to be properly mated to produce the kind of horse which I have been trying to describe. I know that it is a delicate matter to give definite advice on such a subject, but I would like to mention that it is a generally recognised fact in breeding, that the symmetry, quality, and general condition of the progeny follow the sire more than the dam, more especially when the sire is pure-bred (which he should always be) and the dam is not. It is a matter for the serious consideration of the horse-breeders of these districts, therefore, whether the stallions which are exhibited here to-day, are the most suitable for begetting the class of horse which they should aim at. I know that it is not for the want of energy and enterprise that the highest success is not attained, because many of these horses have cost their importers very high prices. But it is very evident, judging by the great variety of type and character of stallion which is represented here to-day, that there is a lack of definiteness in the minds of those that have imported them. I have already said that we want a large number of general purpose horses, suitable for the requirements of the country, but these can be more profitably bred in other stock districts, where they are left to take their chance on the veld, and where the breeders can afford to sell them at a price that would not pay you to rear' them. But you cannot produce a horse of fine symmetry and quality on the veld, where he has to endure all the vicissitudes of weather and drought. To produce symmetry and quality you require to keep your colt growing evenly and continuously from the day he is dropped to the day when he is presented for sale; and that is what the horse-breeders in these districts are in a position to carry out, and if they do they will reap their reward."

Farmers' Congress.

The Annual Farmers' Congress was opened on the 21st ult. at Somerset East under the presidency of Mr. W. H. Hockly, and continued for several days. Many of the subjects discussed embraced some of the more important questions now agitating the whole of the agricultural community of this Colony. The subject of of water conservation and the increase of supplies from underground sources occupied a good deal of attention. The lessons of the great drought are evidently being taken to heart and it is sincerely to be hoped that practical good will come of these discussions. Space is too limited to make further reference to this important congress in the present issue.

Black Spot in Apples.

By calling attention to the dangers threatening the apple and pear orchards of this Colony by the unrestricted importation of apples from Australia, Mr. Merriman, at the last meeting of the Western Province Horticultural Board, did good service to our fruit-growers. The prevalence and spread of the disease known as "Black Spot," in the Australian orchards is a menace to be guarded against. The ravages of the disease are reported to be very serious indeed, and we cannot afford to run the risk of importing it to this Colony with the prospect of it getting a footing in our orchards. It would be a most serious blow to the rapidly developing fruit industry. We have quite enough to contend with, and should exercise every precaution against the introduction of any more imported pests.

Reports of Farmers' Meetings.

A question of some importance to Farmers' Associations, and considerable interest to a large number of the readers of the *Agricultural Journal*, was raised at the last meeting of the Western Province Horticultural Board. It was suggested that reports of all Meetings of the Farmers' Associations should be published in full in the *Agricultural Journal* as they are held. To do this in its entirety would call for a much larger publication than the funds available would permit, and it is more than open to doubt whether it would add materially to the usefulness of the publication. But to make the whole case quite clear, and to meet all interests as far as possible, we may here state that all reports of Farmers' Meetings are carefully considered as they come to hand—whether through the columns of newspapers or sent direct—and anything which is seen to be of general interest is usually reproduced. In fact we go further and have always welcomed the receipt of copies of useful papers read at Farmers' Meetings or important discussions, which we find highly appreciated by the bulk of our readers. It has always to be remembered that all the matter appearing in the *Agricultural*

Journal has to be translated for the Dutch edition and this increases the cost very considerably. If the *Journal* were published in one language only, it would be possible to add many features of interest and increase the size, but so long as the expense of production is so heavy, caused by translation and double printing charges, and the work has to be carried out within strictly defined financial limits, it is necessary to exercise the strictest supervision in order to obtain the best results.

Cattle Dips and Their Value as Destroyers of Ticks.

Our readers will note that Mr. Lounsbury, the Government Entomologist, has conducted a series of experiments at the Rosebank Experimental Station, the main object of which was to increase our knowledge of the action of the substances used for the destruction of ticks. His full report appears in this issue. The results obtained by these experiments were—(*a*) that Arsenic is the principal agent which acts on the ticks in these dips. (*b*) That only the preparations containing the largest percentage of Arsenic, that is only those that were estimated to contain one pound of Arsenic to thirty gallons of water, ever destroyed the ticks; and in most cases even these strongest mixtures failed to prevent a few females from maturing. Mostly, however, such females died without laying eggs, and nearly all the eggs that were laid failed to hatch.

The common Queensland formula of dip is one pound of Arsenic to fifty gallons of water, and although at this strength the dip has the reputation of killing every tick, it is highly probable, in the light obtained by these experiments, that a small proportion will always escape if ticks are present in all stages of growth.

For the guidance of members of dipping tank committees the subjoined statement relative to the percentage of Arsenic which the principal dips at present in use contain when mixed in accordance with the instructions issued by the proprietors, has been drawn up by the Veterinary Branch from the analysis made by the Analytical Department:—

PERCENTAGE OF ARSENIC IN CATTLE DIPS.

As supplied to the public.		When mixed in accordance with the maker's suggestion.	
Dip	Percentage.	Water.	Percentage.
Hayward's Paste ..	13·68 per cent.	11 lbs. in 125 gals.	·12 per cent.
Quibell's	9·6 ,,	10 lbs. in 90 ,,	·106 ,,
Fletcher's (New Strength)	17·67 ,,	1 gal. in 130 ,,	·174 ,,
Alderson's	46·60 ,,	10 lbs. in 140 ,,	·33 ,,
De Muth's	6·34 ,,	1 gal. in 120 ,,	·063 ,,
Cooper's	20·87 ,,	10 lbs. in 100 ,,	·208 ,,

Little's Dip is still being analysed and tested.

It may be mentioned that some of the dip makers since they have discovered that their dips do not kill ticks at the strength at first recommended, are gradually increasing the strength and efficiency of their mixtures. Alderson's Cattle Dip contains the largest percentage of Arsenic Compounds of any dip at present in use, and it has given general satisfaction when used with due care, but as it contains about the maximum amount of Arsenic which can be used with safety, it is necessary to exercise the following precautions:— (*a*) Cattle should be driven to the water immediately before being sent to the dipping tank to prevent then from drinking the dipping mixture; and if the day is warm they should be driven to dipping kraals quietly. (*b*) If the cattle are badly covered with ticks, and their hides raw from the efforts of these pests, there would be some danger of absorption through the broken parts, which would seriously injure the skin and subcutaneous tissue— even if none of the animals were killed by the amount of soluble Arsenic absorbed. Some serious injuries have also occurred to the feet of cattle when sore and raw from any cause prior to dipping. In such cases, it would be advisable to make the first dipping a little weaker than the standard strength.

In these experiments Demuth's dip was found to be a very effective dressing for ticks, but it requires to be used much stronger than the proportions mentioned in the directions. The same remarks apply to several of the other dips. They are all—with the exception of Alderson's— too weak to kill all the ticks, when used at the strength recommended by the proprietors at the present time.—D.H.

The Suborbital Glands in the Duyker and other Antelopes.

Many South African farmers and sportsmen entertain a very strong opinion that the glands which are situated in the pit-like depressions immediately under the eyes of the "Duyker" are gall glands which secrete bile. Their principal argument in support of this opinion is that the "Duyker" has no gall bladder attached to its liver A similar opinion used to be just as strongly held with respect to the horse,—which is also without a gall bladder. The horse's gall was supposed to be somewhere about his head, and that in acute pulmonary Horse sickness, when that yellow sero-albuminous fluid came pouring down the affected animal's nostrils characteristic of that disease, it was firmly believed that the gall had burst and that this yellow discharge was its contents. To return to the "Duyker." These suborbital glands are usually described as lachrymal sinuses, or tear pits, while others describe them as glands which secrete a waxy substance with a strong odour which probably serves as a means of recognition between the sexes.

My friend Mr. George Stevens of Blueberg directed my attention to this subject some months ago. He told me that he had made very close observations on the habits of these bucks having had tame ones under his charge. He states that these glands pour out their secretion most copiously when the buck is either feeding or ruminating and that there is no perceptible secretion at any other time. He adds it is most interesting to watch the buck quickly extending its tongue first up one side of its cheek, and then the other with great rapidity, and licking in the secretion as it runs down from the glands. This would appear to indicate that these glands acted under the same stimulus as the salivary glands, and the probabilities are strongly in favour of the opinion that the secretion assists mastication, and deglutition, and it may also also exercise some chemical action on certain constituents of the food. The subject is a most interesting one and deserving of further investigation.—D.H.

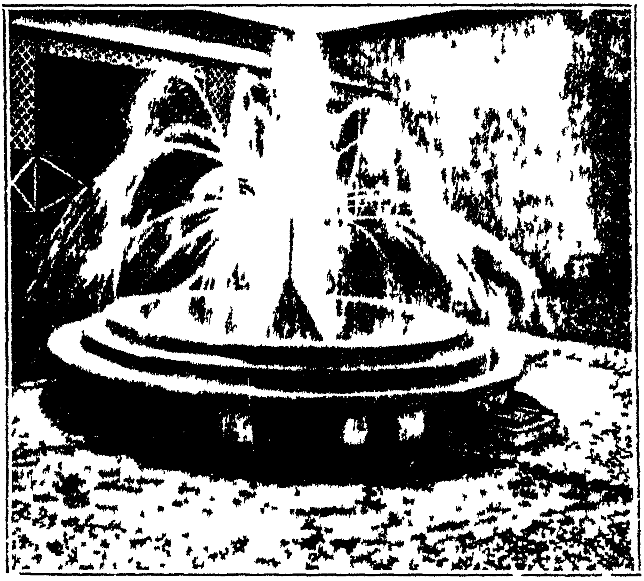
The South African Stud Book.

The Cape section of the South African Stud Book has made an important forward movement by the appointment of an organising secretary and executive committee. At a meeting of the Registration Board at the Rosebank Show a deputation was arranged to meet the Minister of Agriculture with the view to securing the Government's financial assistance, which was obtained, seeing that the co-operating colonies were now doing their share. The executive is losing no time in getting the necessary preliminaries completed, which must of necessity take time, in view of the magnitude of the undertaking, which is bound to result in the improvement of the stock of the country. The headquarters of the Cape section has been settled, *pro. tem.*, at Klipplaat, and Mr. C. G. Lee has kindly consented to act as Organising Secretary for the present. The books will shortly be open for registering stock.

FARM AND VELD.

Mr. W. R. Southey's Fountains.

In the descriptive illustrated article on Mr. W. R. Southey's farm Varkenskop, published in our January issue mention was made of the ornamental fountains in front of the house. Since this appeared we have been favoured with an excellent snap-shot of one of these in full play which is reproduced herewith. Could any words speak louder in praise of the work done on this farm? Ornamental fountains playing in front of a homestead in the heart of a drought-stricken country like the Middleburg district is just now, call for no further comment.



Soakage from River Beds.

"Apex" writes that he has often heard farmers say they could get water by sinking anywhere alongside river beds. If this is so, let us consider the quantity they are likely to get: leaving springs out of our calculations, for, though numerous, they do not occur anywhere and everywhere. Then we are reduced to soakage only. We all know that by digging in a fine sea sand or in a fine river sand we generally get enough water for our coffee when camping out, but this fine sand does not yield its water readily and American experience shows conclusively that wells sunk from above flood level to such beds, though they be considerably below the river, will certainly not prove a success for irrigation purposes and are doubtfu undertakings even for watering stock unless the requirements are very small. Experiments too indicate that the horizontal flow of water in this fine sand and soil is extremely slow and that enough for a small pump can only be got from a thoroughly saturated sand bed by having a large well n which it has time to accumulate.

But there are other circumstances more favourable for getting soakage, for instance a sharply inclined rock bed crossing a river and having on the upstream side of it an extensive gravel and coarse sand deposit, admits of a well being sunk close to the well bar (or wall of the reservoir,) and carried down some ten feet or more below the river into the gravel, before bed rock is struck. Here we can usually obtain ample for stock and frequently enough for several acres of lucerne the exact amount available, depending on the extent of the gravel, the nature of the material mixed with it, (whether clay or coarse sand) and the frequency of water in the river near this spot, such underground water tanks are commonly marked in the river banks by a "conglomerate" formed of coarse gravel and sand cemented together by the precipitation of the lime in the water when exposed to the air. Much water must not be expected from soakage wells unless the circumstances are very favourable such as a permanent stream passing over portion of a large gravel bed, or a substitute nearly as good is a considerable area close by, under frequent irrigation. With such conditions the yield is very large.

The Pasteurisation of Milk.

Where it is desired to make sure of milk keeping for a limited time without change in taste or appearance, the process of pasteurisation is strongly recommended. In order to absolutely sterilise milk, it is necessary to raise the temperature so high that a boiled flavour is unavoidably imparted, and a scum formed on the surface by the coagulation of part of the albumenoid matter. Pasteurisation which entails heating the milk to from 65 to 70 degrees C. (149 to 158 degrees F.) only, while avoiding these evils, so materially diminishes the number of bacteria present that the milk remains sweet for a much longer time than it would otherwise do. Pasteurisation is therefore much practised by vendors of milk for direct consumption in towns, while cream is frequently pasteurised, so that the process of ripening for churning may be artificially controlled.

A preliminary step in the treatment of milk should always be careful straining through brass wire gauze and muslin, immediately on its removal from the cow-house or kraal. On a small scale the readiest way to pasteurise milk is to place it in a small vessel of hot water, stirring the while so as to rapidly bring the milk to the desired temperature as indicated above. The use of specially constructed pans for this purpose is strongly recommended, both as an economy, and by way of simplifying the process, and rendering the results more certain. Any dealer in dairy supplies should be able to furnish such, and the "Verilix" Milk Scalder (Dairy Outfit Co.) may with confidence be recommended for the purpose.

The next step in the process is the rapid cooling and aeration of the milk. For this purpose there are many devices in the market, all similar in principle. Milk is made to trickle down in a thin film over metal pipes within which a current of cold water is flowing, whereby the temperature is lowered to about 15 degrees C. (59 degrees F.) During this process it will be noticed that the milk is very much exposed to the air, and, while this is necessary, in order to remove "cowey" and other objectionable flavours, the milk is liable to contamination unless the air through which it passes is kept very pure. The work must therefore be carried out in scrupulously clean surroundings, and it is impossible to pay too much attention to details in this connection even to the extent of being laughed at by critical neighbours. From the cooler the milk may be passed direct into the cans for delivery to customers or creamery as the case may be.

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On a large commercial scale the plant necessary consists of the following parts. A pasteuriser or milk heater consists of a jacketed cylindrical block-tin vessel, up the centre of which passes a spindle carrying blades for stirring the milk. The spaces between the double walls are for the steam, and the outer case is well sheathed in asbestos packing to prevent loss of temperature. The milk passes into the innermost chamber where by rapid revolution it is brought into immediate contact with the hot metal surface, and scalded. It is then run off and the pasteuriser is ready for a fresh supply. Various devices are employed for the purpose of increasing the efficiency or economising the heat, into which it is not necessary to enter here.

The apparatus can be obtained in a great variety of makes and sizes, from a capacity of 55 gallons to 1350 gallons per hour, and costing (f. o. b. London) from £11 to £80. Different forms exist for the manipulation of new milk, of cream, and of new or skim milk, and, as dealing in this class of machinery, The Dairy Supply Co., Ltd, Museum Street, London, W., Messrs. L. Lumley & Co, Ltd, Dublin: (Messrs. W. R. Harding & Co, 44a, Castle Street, Cape Town): and the Dairy Outfit Co., Ltd, Kingscross, London (Messrs. Neale and Wilkinson, Port Elizabeth): and The Alpha Laval Co, (Messrs. Howard Farrar and, Robinson, Port Elizabeth) or (Mr. J. Woodin, Mariendahl, Mulder's Vlei Station).

The process of cooling, already alluded to, on the small scale, is exactly the same where larger quantities are handled, and plant corresponding to the scale of the work contemplated can easily be obtained.

Subcutaneous Emphysema, or Air Under the Skin in Ducks.

The Chief Veterinary Surgeon writes : We have received some young ducks for examination, and have heard of a number of others in which the cellular tissue under the skin is enormously distended with air. In one very pronounced case the duck looked more like a toy duck formed of a bladder distended with air than a living bird formed of solid tissues. The subcutaneous cellular tissue over the whole body was tensely distended with air. But notwithstanding this extraordinary condition the duck did not appear to manifest any particular pain or even distress. It could walk with comparative ease, and ate food moderately. Being an exaggerated case it was retained for treatment. This consisted in puncturing the skin in places, with a small trocar and canula, and pressing the air out Slight massage was applied to the skin all over the body. This operation had to be repeated at intervals during the first two or three days, as the air accumulated under the skin again very rapidly. Meanwhile the duck fed well and appeared to suffer comparatively little visible discomfort. After some days with the exception of a little puffiness about the head and neck, the skin appeared to be becoming re-attached to the subcutaneous tissues—and further treatment was stopped as the attendant reported that it was going on all right. About eight days after it was sent for again for re-examination, when it was discovered on tapping the swelling in front of the breast that instead of air alone escaping bubbles of fluid were mixed with it and it was observed to be somewhat septic in character. The duck was then killed for the purpose of making a post-mortem examination. This revealed the following lesions :—There was a little fluid exudation into the cellular tissue under the skin, more particularly on the left side and around the head and neck. The left lung was affected with septic pneumonia, and the left cervical air reservoir or sac was ruptured, thereby permitting free communication between the left lung and the subcutaneous cellular tissue. It may be necessary to explain that in birds the organs of respiration are very different from those of mammals. In birds there are four pairs of air sacs or reservoirs—and one single. These communicate freely with the lungs and with some of the bones. These sacs are named according to their position as follows :—two cervical; too anterior diaphragmatic; two posterior diaphragmatic, two abdominal and one thoracic sac. Besides giving additional air space for the purposes of respiration—the lungs being comparatively small—these air sacs assist locomotion, by diminishing the weight of the body, and by their position rendering equilibrium more stable.

Causes of Rupture of Air Sacs, or the air cells of the Lungs.

This is usually due to violent exertion of any kind. Ducks are most liable to this because young ducks as a rule when disturbed rush about like mad things, tramping on and crushing one another. It is comparatively rare in fowls. The treatment consists in carefully puncturing the skin with a small trocar and canula, or a small knife, and carefully pressing out the air. Make as small an opening as possible and see that the instrument is clean. Gentle massage should also be carried out so as to expel the air from the cellular tissue, and allow it to resume its healthy function. In mild cases, they recover rapidly, and suffer very little.—D. Hutcheon.

The Indian Buffalo.

Mr. D. E. Hutchins, Conservator of Forests (Western) writes:—"I do not think the *Agricultural Journal* has ever had a more useful article than that of August last concerning the domestic buffalo. I was brought into constant contact with this useful animal when in India, and have frequently seen it (in Cape climates) along the Mediterranean. I write a few lines now in addition to what was said in your admirable paper of August last, in order that the subject may not be overlooked. I feel confident that it is a neglected asset which Cape farmers have not yet had the chance of trying.

"To begin with, the buffalo is not a weakly exotic ill-suited to the climate like so much of the stock imported from northern Europe, but it is a hardy beast, thoroughly at home in South Africa in almost every part of the country. It has been asserted that it will do best in wet country where there are swamps for it to wallow in. No doubt it loves water like a duck, but under domestication it does very well in countries which are far from wet. I spent 10 years on the Mysore plateau in Southern India, which in climate is very much like Rhodesia. Here the buffalo was looked on as a sort of extra-hardy ox. If we were working in the forest and there was a difficult piece of timber to move, the contractors with oxen would make way for a contractor with a team of buffaloes. If there was an unhealthy part of the country where oxen sickened and died, it was the buffalo that took the place of the oxen and did all the hauling work of the country. And in such country it was the she-buffalo that provided us with milk and butter. And here alone, perhaps, I am not entirely in accord with your correspondent. Buffalo milk may be very good and rich, but buffalo butter was never a popular article on the table of Europeans in India. It had not the colour nor consistency of cow's butter. Possibly this was because it was not properly made. I am simply giving you my experience of buffalo butter as I recollect it.

"In Egypt, Italy and the Mediterranean countries the domestic buffalo is a familiar object. Here you have Cape climates, so that between the higher districts of India and the climate of the Mediterranean you may say that you have every South African climate in which the buffalo can live and thrive. May I express the hope that some of the wealthy men who are now settling on the land in South Africa may be induced to turn their attention for a moment from those tempting north European cattle—so sleek and so tempting in their northern homes, so disappointing in extra-tropical latitudes—to bestow a little attention on animals climatically suited to South Africa, such as the Arab horse and the domestic buffalo.

"If the Forest finances were not so terribly crippled I should try to induce Government to let us import a few pair for work in the forest. At Knysna the sickness and failure of cattle is one great obstacle to the more economic working of the forest. One might look on the importation of domestic buffaloes and trained elephants as not the least hopeful among the measures proposed for the amelioration of the Knysna woodcutters."

Preserving Meat on the Farm.

The old method of pickling meat in a strong saltpetre brine (writes Gerald McCarthy, biologist, North Carolina Department of Agriculture) is still very generally used by farmers in putting up their annual supply of meat. This method produces a strong flavoured and rather dry and indigestible product. There is a popular impression that saltpetre is a very powerful preservative and that salted meat will not keep without it. In fact saltpetre is not a preservative at all. It is a strong astringent, hardening the meat fibres, expelling the natural juices and decreasing the nutritious qualities of the meat. When taken into the human body in quantity, saltpetre acts as a powerful irritant to the mucus membranes of the stomach, bowels and kidneys. Death has been caused by large doses of this substance. The use of saltpetre upon meat is unnecessary and undesirable. A much better and safer substitute is Cream of Tartar—Potassium bitartrate.

Of recent years manufacturing chemists have not been backward in offering to farmers and butchers various meat preservatives, sold under fancy and misleading names, at exorbitant prices, These "patent" meat preservatives and colouring matters are all injurious to health and should be let severely alone. To make a good, mild and wholesome meat pickle take the following materials,—for each 100 pounds of meat: Common salt, 8 pounds: Brown sugar, 2 pounds: Cream of tartar 2 ounces: Water 4 gallons. Directions: First boil the water for 15 minutes and then stir in the salt sugar and cream of tartar. Keep hot until all dissolved. Let the pickle cool before using.

Pack the cut meat as solidly as possible in a clean barrel. Place the larger pieces at the bottom. No piece should measure over 6 x 12 inches. Pour on the cooled pickle and completely cover the meat. Cover the barrel tightly and set away in a cool, dark, dry place. The meat may remain in the pickle until wanted for use. If to be smoked, remove from pickle after six weeks and drain for a day or two before smoking. To smoke use green hickory wood. Those who like a flavour may add a few chips of sassafras, or juniper berries are preferred by some. The smoke-house must be dark and air-tight except the chimney. This should be covered with wire mosquito netting. The "skippers" which so often damage farm cured meat attack the meat in the smoke-house. The parent of the "skipper" is a small fly which infests meat houses, but which may be easily kept out by means of wire netting and well closed framing

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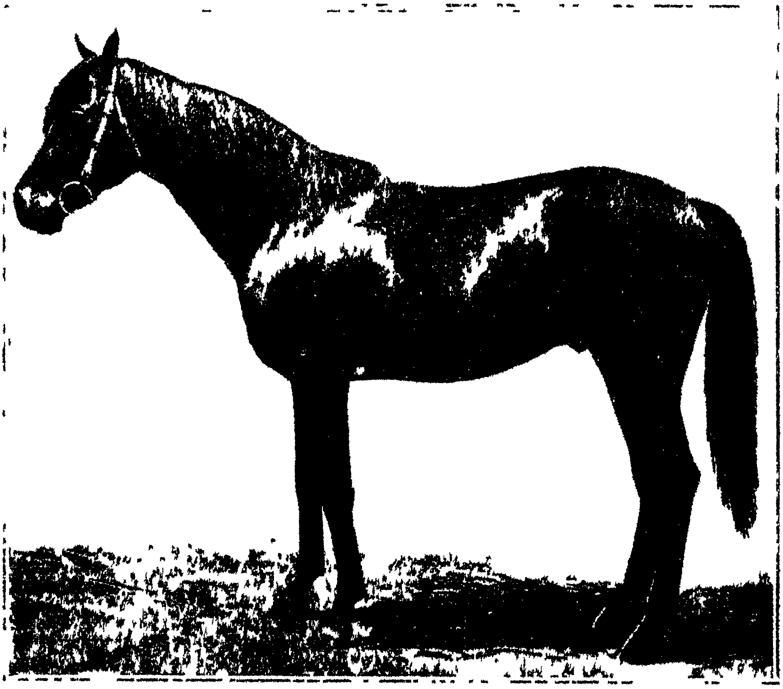
After smoking until a light brown colour is attained, wrap each piece of meat in brown paper and enclose in bags made of unbleached muslin. Tie or sew these securely, then dip the bags for two minutes into a thick lime or ochre wash to which has been added a little salt and some liquid glue. The water used in making this wash should have been boiled. Instead of bagging the smoked meat it may be packed solidly and deeply in clean dry oats or chaff. It is not generally known that fresh meat and sausage may be kept sweet and sound during the cooler months by boiling or frying until about half cooked and then packing solidly into earthen jars. Pour over the packed meat hot lard until completely covered. Cover the jars and set away in a cool, dark, dry place.

"VICTOR DON."

"Victor Don" was bred by Mr. Lascelles, foaled in 1895. He is by "Donovan," out of "Capucine." Donovan is by "Galopin," by "Scottish Chief," by "Stockwell." "Capucine" is by "Camballa," her dam "Matilda" by "Beauclere," Grandam by "Cathedral," out of "Empress." This horse was recently selected by Mr. J. M. Orpen, and sent out to his son to place at the stud on his stud farm, Avoca, in the district of Barkly East. The accompanying photograph does not do justice to the horse; he appears in it to be a small horse, whereas he stands 16 hands, with plenty of substance and good bone. He is also a horse of fine symmetry and good straight action. Just the kind of horse to get first-class riding and driving horses if mated with suitable mares. I am unable to give the whole of Victor Don's performances on the turf, as I have not the whole of the records to refer to. He does not appear to have run as a two-year old, and his performances as a three-year old were not prominent. As a four-year old he ran eight times, five of which he caught the judge's eye; twice he was second, and once third. All these races were from one up to two miles, and he was usually top-weighted. In the Southdown Club Long Welter Handicap of two miles at Lewes, he carried twelve stone to victory. In 1900 he ran five times, once a winner, and once second. All these races were over a mile. In 1901 he won the Trial Plate Sandown, one mile, beating ten others. He also won the Lancashire Handicap of £875, beating eleven others. He carried eight stone, and beat such horses as "Royal George," "Spring Meeting," and "Light Comedy." In 1902 he started for the Lincoln Handicap, when "St. Maclou" won, "Sceptre" being second, and "Over Norton" third. Victor Don was placed eighth. He was next beaten by a neck in the Great Cheshire Handicap of £900, in a field of ten. He next won the "Longleat Plate" of a mile at Salisbury, carrying top weight. He also ran at Ascot and there won the High Weight Handicap of one and a quarter miles, beating fourteen others, and carrying one pound less than the top weight. He is still as sound as a bell, and as clean in the legs as ever he was. I am glad to hear that he is proving an excellent sire.—D. H.



EXTRA TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries.

By D. E. Hutchins, F.R. Met. Soc., Conservator of Forests.
Cape Town.

Continued from page 185).

BOTANICAL NAMES AND AUTHORITIES.

It is customary amongst scientists to place an abbreviation of the name of the botanist who has described a species after its name, thus, *Eucalyptus coreacea, A. Cunn.* Here *"A Cunn"* is an abbreviation of Allen Cunningham. To the general public these hieroglyphics are unmeaning and confusing. They add to the difficulty which is experienced by many people in remembering or even reading the clumsy botanical names that (more especially recently) have come into vogue. In this work an endeavour has been made to render the botanical names clear by adding the name of the author of the botanical name in full (in small print) in those rare cases where it seemed necessary to do so to avoid confusion, as where two botanists have used the same name. Otherwise they are omitted. A reference to the author or original inventor of a botanical name is only of real interest to the taxonomic botanist. In that charming work, "Nature Studies," by the botanist of modern times who has travelled most largely in Africa, G. Scott Elliott, we find the author of the botanical names omitted throughout the work. In communications addressed to the public from Kew, botanical authors are also omitted. Neither does the botanical author appear on the labels in Kew Gardens. This is in striking contrast to the curious little absurdity seen in the Botanic Gardens' labels in Cape Town, where the botanical author, or a grotesque abbreviation representing him, appears in letters larger than (sometimes three times the size of), the botanical name. No doubt in botanical literature the names of botanical authors must continue to be used until the botanical names have become fixed, that is to say, for many years. But it is in the interest of botanical names themselves that they should be kept as simple as it is possible to make them. To add hieroglyphics to represent the name of a botanical author renders the name still more complex and difficult to acquire.

But it is better to try to remember the scientific names, clumsy, meaningless or misleading, as they so often are, than to trouble about uncertain popular names. Though, when the popular name becomes really fixed, its brevity, expressiveness and unchangeableness may give it an advantage over the botanical name. Thus, "Norway Spruce" is not only simpler but more precise than *Picea excelsa*. This, one of the commonest of forest trees, has had a multiplicity of Botanical names · and even so late as 1874 we find Sir D. Brandis in his Forest Flora describing it as *Abies excelsa*, while Mueller, following Linnaeus, calls it *Pinus picea* in his "Select plants for extra-tropical countries," 1895. The Douglas pine is still without a settled Botanical name. Dr. Masters and the American botanists call it *Pseudotsuga douglasii*, while in the recent new edition of Veitch's Manual of the Coniferae —an admirable work—*Abietia douglasii*, is proposed.

In the following work the names adopted are those of the Index Kewensis, so far as these do not appear to be out of date, compared with more modern botanical works, such as Gamble's "Indian Timbers," and the Australian writings of Maiden and Bailey, Government Botanists of New South Wales and Queensland. For American trees the names given in Sudworth's "Check List of Forest trees of the United States of America," 1898, have been adopted whenever they did not appear to conflict with the more conservative and practical methods of Kew. For the troublesome coniferous names, Dr. M. T. Masters has been followed with one exception—that important forest genus, *Callitris*, whose proposed sub-division will not, I think, be maintained—see his "Introduction to Handlist of Conifers grown at Kew." In the case of *Callitris*, I have followed Bentham's "Genera plantatum," 1881, and maintained *Tetraclinis*, *Frenela* and *Actinostrobus* under *Callitris*—the Cypress of the Southern Hemisphere.

For convenience, simplicity, and uniformity, I have followed the increasing practice of writing the initial letter of the species of a botanical name always with a small letter.

For the identification of many Cape species, I must offer my acknowledgments to Professor (now Dr.) MacOwan. Most of the botanical work on South African trees has been done by Mr. T. R Sim, now Conservator of Forests, Natal, and latterly by Mr. Burtt-Davy, the Government Botanist, Transvaal. For the notes on North American trees, I am chiefly indebted (1) to Hough's clear and practical descriptions accompanying his beautiful timber sections (2) to Sargent's monumental Forest Flora, a work of unapproachable excellence. For Himalayan trees to the writings of Sir D. Brandis and Mr. J. S. Gamble. For Conifers grown in England to Veitch's Manual. For Australian trees to J. H. Maiden, von Mueller, M. Bailey, and R. T. Baker. For various sylvicultural notes on Australian trees, I must acknowledge my particular indebtedness to Prof. J. H. Maiden, the Government Botanist of New South Wales. A forest flora for Australia on the lines of Gamble's Indian timbers is greatly wanted, even after making every allowance for that most useful work now appearing—Maiden's Forest Flora of N. S. Wales.

Of the professional Foresters who have visited Australia none have published any connected account either of the forests or the sylviculture of their trees—trees that for the extra-tropical regions of the world are so important on account of their rapid growth and resistance to drought. For the ignorance of Australian sylviculture no country, except perhaps South America, suffers as much as South Africa.

Many hundreds of thousands of pounds have been spent in South Africa on the planting of Australian trees. Much of this tree-planting has been ill directed, much of it has given poor results, solely from our ignorance of Australian sylviculture.

ABSENCE OF NATIONAL FORESTRY IN ENGLAND AND ITS EFFECT ON THE NATIONAL CHARACTER.

Unfortunately people's views on Forestry, as indeed on most other matters, are influenced by sentiment and education. On the Continent of Europe these tell strongly in favour of Forestry. In an English community it is difficult to obtain a serious consideration of the forest question from even a purely business point of view. Public sentiment does not grasp the conception of national forests at home and in our midst. It is the forest destroyer who is hailed as a public benefactor. Says Friswell in his popular essays "The Gentle Life," "Our ancestors who have fought and bled and *cut the forest,* and made the road for us, and who have built enduring temples, and made glad the hearts of men with noble works, did something for us." Truly, but what did they do for us? They utterly effaced from the earth nature's most beautiful handiwork when they destroyed the ancient forests of England—its temples not made with hands. It is questionable if all the temples and all the roads are worth the forests that they destroyed so wantonly and ruined so ignorantly. The Spaniards in Mexico are perhaps the most complete historical parallel.

Take another popular writer of a different stamp. Geikie in his admirable physical geography handles his subject in the ablest and most comprehensive manner, yet with one remarkable exception. He entirely ignores what a Continental writer would have placed first—the action of forests. And yet no agency in modern times has operated so powerfully in remodelling the physical condition of the earth's surface. See "Man and Nature," (Marsh). Forests give us coal in the past and to-day water and fertility on otherwise barren mountains. It is true that these causes operate to a less extent in England and hence perhaps the peculiar warp in the national sentiment on the subject of forests.

Careful observers tell us that this warp in the national character is being slowly modified by the growth of England beyond the sea. And probably, in view of recent events, this is so. In the meantime, Forestry, in all English communities, is up-hill work; oft times undertaken fitfully, and abandoned precipitately, as soon as the first difficulties are encountered. This has happened recently in the Australian Colonies. For many reasons it is better not to attempt the formation of national forests till the growth of a national sentiment strong enough to maintain and defend them. As an instance of the power of national sentiment take the war with France at the beginning of this century. It cost England 600 millions (£600,000,000) to crush Napoleon. The larger portion of this expenditure—all the land expenditure, was a matter of sentiment. It is doubtful whether it hastened his fall by one year. Yet who would have dreamt of applying this expenditure to the restoration of the national forests. Nevertheless about one-fifth of the cost of the Napoleonic wars would have sufficed to restore the national forests so far that they would have been able to meet the entire present importation of home-growing species of timber.

Looked at from a business point of view the position in Great Britain is this:—England now pays £26,000,000 yearly (Board of Trade Returns, 1902) for imported timber that could be produced about twice over within the limits of the British Isles, if the ancient forests were restored so far only as to cover the present waste lands on mountain and heath. According to Prof. W. R. Fisher there are 16,692,000 acres of mountain and heath land unsuitable for agriculture in Great Britain, with rentals per acre varying, from a few pence in the West of Ireland, to 4s. in England (Prize Essay, Company of Carpenters, 1904). According to the report of the recent Commission on British Forestry there are 21,000,000 acres of heather and rough pasturage in England and Scotland available for reforesting.

From 8 to 10 million acres would be required to produce in Great Britain the timber now imported. Prof. Fisher, in his prize essay quoted above, estimates 10 million acres or at the rate of an acre per ton of imported timber. In a paper awarded a medal by the Society of Arts, London, written by me in 1889, I propounded a scheme which contemplated spending £1,000,000 a year, or about 1 per cent. of the National Revenue, in restoring the ancient forests of England and rendering to the land its former beauty and productiveness. This would give the country forest at the rate of about one and a half "New Forests" to every county. See page 336 "Schemes for National Forestry."

Such a proportion of forest would give employment on the land to so many, as to have an appreciable effect on the health and well-being of the community. It would have an important bearing on that great social question, the decay of the rural population of England. The Boer War showed pretty plainly that if this continues at the present rate, the British Empire may fall to pieces for want of recruits for the Army. "In Germany it is estimated that the yearly wages of people employed on forest industries amount to something like £30,000,000 sterling, and that roughly 12 per cent. of the total population of Germany is employed in the forest and out of the forest —about 1,000,000 people in the forest, *i.e.*, directly employed in working in the forest estates, and about 3,000,000 out of the forest, *i.e.* in working up forest produce, chiefly timber, into the various articles manufactured from wood. These forest workers in Germany are the pick of its manhood, the backbone of the nation. In England they have been replaced by the weakly hysterical, knock-kneed factory operative, and his sickly tea-drinking wife, whose mistaken ambition is to avoid the health and strength following manual labour out-of-doors! These are sad facts which struck me very forcibly when travelling through the forests of the Continent and the rural districts of England. It was not till I got to Scotland that I saw a woman working out-of-doors. In the first part of the Boer War, out of 11,000 men offering themselves as recruits in the Manchester district 8,000 were found to be physically unfit to carry a rifle, and of the 3,000 who were accepted, only about 1,200 attained the moderate standard of muscular power and chest measurement required by the military authorities." (R. E. Dudgeon, M.D.) England can better afford to pay the cost of its wasted forests, viz., £26,000,000 a year, than allow the present waste of its manhood to proceed!" ("Some Aspects of South African Forestry," S.A.,A.A.S. 1903).

I have mentioned the position of Forestry in England and its effect on the English National Character in order that Foresters in South Africa may be prepared to make allowances for it; exactly as would a soldier if his actions were criticised by an effeminate Bengali. The sentiment of fighting is as absent from the Bengali's instincts as is that of national Forestry from the Britisher's instincts. There is not a forest scene by an English painter in the National Gallery and very few by foreign painters.

"We are a people of enormous waste. We waste simply by not pursuing scientific methods. I do not like to compare us with Germany. We are not methodical; we are not scientific; we are not abreast of the more advanced nations of the day."—Lord Rosebery's speech at Chatham, 23rd January, 1900.

SCHEMES FOR NATIONAL FORESTRY IN ENGLAND AND SOUTH AFRICA.

Besides keeping twenty six millions yearly in England and one and a half millions yearly in South Africa there are various attendant advantages which tell strongly in favour of National Forestry. They will be found set forth briefly in four pamphlets and reports published recently by the author, the first two of which have been reprinted by the Agricultural Department of Cape Colony. The third has been published by the Rhodes Trustees; the fourth by the Transvaal Government.

(1) "National Forestry" (England) in Jour. Soc. of Arts, London, November, 1899.

(2) "National Forests" (Cape Colony) Philosophical Soc, Cape Town, August 31st., 1898.

(3) Report for the Rhodes Trustees on the Matopo Park: also a note on Forest Policy in Rhodesia, 1903.

(4) Transvaal Forest Report. Pretoria 1903.

ENGLAND.

In the first of these pamphlets (written when last on leave in England) I have advocated an expenditure of £1,000,000 yearly for 134 years to plant 9,000,000 acres and thus produce at home the timber now imported. 9,000,000 acres was assumed as a liberal allowance to permit of increased timber requirements with the growth of population. A mean yearly yield of 60 cubic feet (Acrim) would require 6,666,666 acres to meet the importation (400,000,000 c. ft.) of the year 1902. Prof. Fisher of Coopers Hill indicates 60 cub. ft. as the probable average yearly yield in his prize essay quoted above, so that nine million acres is a liberal estimate. The advantages of this scheme were set forth under the following heads:—

(1) £26,000,000 more produced yearly in the country.

(2) 750,000 people kept on the land.

(2) A forest playground for every man, woman and child; with a fostering of the love of nature and of the beautiful.

(4) Less smoke in the large towns. London fogs are estimated to do damage to the extent of £5,000,000 yearly.

(6) Aid in defending the country against invasion, both from the forests themselves and the corps of trained Foresters, 150,000 strong.

(6) National insurance. When money is abundant, spend it in restoring the productiveness and the beauty of the homeland.

It was urged that this work should be put in hand at once on account of:—

(1) The shrinkage in foreign sources of timber supply.

(2) The fall in the value of land in Britain.

(3) Low price of Consols. Money could then be borrowed at 2 per cent.

It was pointed out that with Consols at 2 per cent. this great work of restoring the English forests could be accomplished at no final charge on the public purse; probably, at some considerable gain.

This paper was awarded the silver medal of the Society of Arts, London, and I had the advantage of discussing the scheme with an English Cabinet Minister. But it must be many years before public opinion in so conservative a country is ripe for a scheme of National Forestry.

CAPE COLONY

The value of timber imported into Cape Colony may be averaged at £500,000 yearly. To meet this I recommended in my Yearly Report for 1902 the borrowing of £500,000 to be devoted to planting 40,000 acres at £12 per acre. In the same year the Administration of the Cape Government Railways adopted my scheme of laying down Pine plantations and Eucalypt plantations of the Jarrah and Ironbark class of timber, to grow in Cape Colony the sleepers now imported at a cost of £100,000 worth yearly. These plantations are now in progress—nearly half finished. The scheme provides for the planting of 35,000 acres of Eucalypt and 3,000 acres of Pine at a total expenditure of £60,000, spread over 6 years. (£50,000 now authorised) This is estimated to produce 1,050,000 cub. ft., the present requirements of the Cape Government Railways for sleeper renewals being about 1,000,000 cubic feet.

TRANSVAAL.

In 1903 I visited the Transvaal and framed a report on the Forest Question in that country. That report recommended an expenditure of £100,000 yearly for six years to plant 50,000 acres at £12 per acre, in order to produce in the Transvaal about seven and a half million cubic feet, the timber now imported at such ruinous cost from abroad. The cost of planting and rates of growth are similar to those prevailing in Cape Colony, but the trees suited to a scheme of National Forestry in the Transvaal differ considerably from those suited to Cape Colony.

At the same time I discussed the formation of sleeper plantations with the Railway Administrations of both the Transvaal and Natal. I understand that both countries intend starting sleeper plantations on lines similiar to the Cape, as soon as the close of the present financial crisis will admit money on favourable terms.

RHODESIA.

In 1902 I visited Rhodesia and made certain suggestions regarding a forest policy for that country. Sleeper plantations are not required there, but plantations of durable softwoods, such as the Mexican Cedar, are in urgent demand. The extensive hardwood forests of the country can be improved by fire-protection, and probably by thinnings made with the view of husbanding the sub-soil moisture.

THE CULTIVATED FOREST OF POPULOUS COUNTRIES.

A few years ago a member of the English Cabinet remarked to me that England was too densely populated for national forestry. This view has been expressed before by those who look on a forest as merely waste land. They do not know what a productive highly cultivated entity it should be. The most productive forests in France are those in the fertile and populous country near Paris, the least productive are those on the distant Alps and Pyrenees mountains. The same thing is seen in Southern Austria—Bohemia, Moravia, Silesia and the plain of the Danube, where forest covers 30 per cent. of a thickly populated country. Some of this forest I have seen. It can compare favourably with any in Europe.

"Here is a community of pre-eminent intelligence in whose midst forestry societies flourish; where the forests, instead of being stocked, as those of other parts of Austria, with the species implanted by Nature, are composed of the varieties which the hand of man has substituted for them. The latter have been planted partly on account of their complying more satisfactorily with the demands of their consumers, but chiefly on account of their superior value from an investor's point of view. It may, therefore, be said that in this region the forests are the work of man in a sense similar to that applicable to agricultural or industrial productions. Several railway companies use wood as fuel in their locomotives."—(*Wesseley*).

Belgium, the most thickly populated country in Europe, pays yearly about £3,000,000 for imported wood and produces £4,000,000 worth at home. The Belgians began serious forest work in 1884, the same year as the Cape. Belgium has made a very good start in forestry. Besides the State Forests and Government Forest Department, there is a great National Forestry Association embracing all classes of Society, from the King to the peasant. Young trees are issued free from the Government nurseries.

Japan is another densely populated country where the forests have been cultivated for centuries and where much of the forest is entirely the work of man. While the national forests in the mountains were, until recent times, neglected, the plains have been dotted over with timber plantations with an industry and intelligence that would be surprising in any other people but the Japanese. Of these the most notable are the plantations of bamboos, and of *Pinus thunbergii* on barren sandy land.

CONCLUSION.

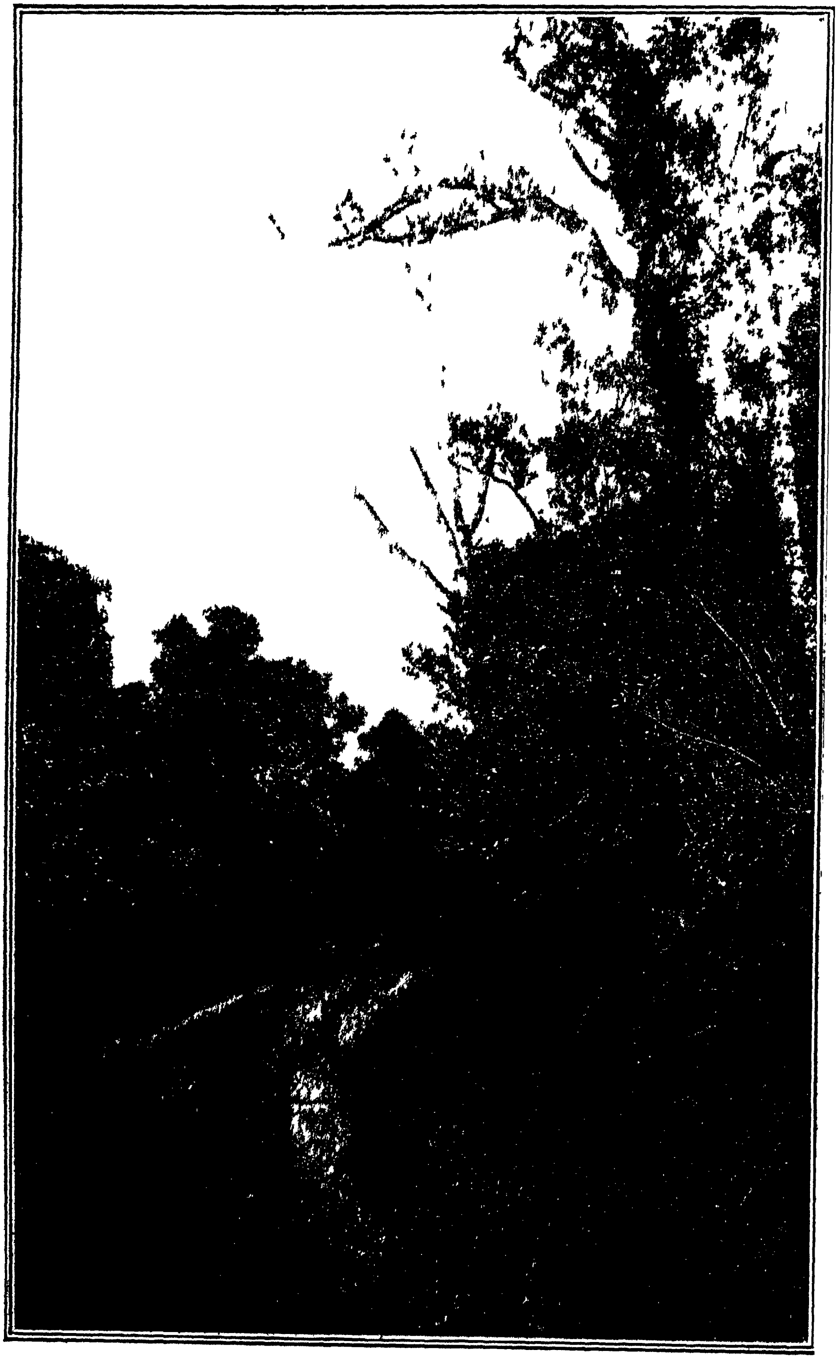
Over half a million pounds sterling has been spent on the planting and regulation of the Cape Forests since I came to the Colony in 1883. Three things seem necessary to put this great work on quite a satisfactory footing:

(1). A better observance of the Forest Act so as to give a secure tenure to the National Forests.

(2). The sending of an experienced Cape Forest Officer to Australia to study in their natural habitats the sylviculture of the trees we are planting so largely. And similarly the Transvaal should send a Forest Officer to Mexico.

(3). Text books of the indigenous and of the introduced trees.

An able text book of the indigenous trees has been prepared by Mr. Sim, the Conservator of Forests, Natal. My work may be looked on as the first edition of a text book for the introduced trees. It will appear in the Cape *Journal of Agriculture*, and afterwards separately in book form. Extra-tropical trees, particularly those that have proved suitable in South Africa, will be treated in detail in this work—perhaps the general reader will say in too much detail, but we must consider the case of the planter who desires to be placed in possession of all we know about any particular tree. Notes also will be added of the extra-tropical forests of various countries. This will be prefixed with general notes on the treatment of a timber plantation in South Africa, taking its various features in order from seed to sawdust.



Indigenous Forest, Knysna.
(W. B Baker.)

THE FOREST TREES OF EUROPE.

And foorth they passe with pleasure forward led,
Joying to heare the birdes sweet harmony,
Which therein shrouded from the tempest dred,
Seemed in their song to scorn the cruell sky.
Much can they praise the trees so straight and hy,
The sayling Pine; the Cedar proud and tall;
The vine-propp Elm; the Poplar never dry;
The builder Oake, sole king of forrests all:
The Aspen good for staves; the Cypresse funerall;
The Laurel, meed of mighty conquerers
And poets sage; the Firre that weepeth still;
The Eugh, obedient to the bender's will;
The Birch, for shafts; the Swallow for the mill;
The Mirrhe, sweete-bleeding in the bitter wound;
The warlike Beech; the Ash for nothing ill·
The fruitful Olive; and the Platane round:
The Carven Holme; the Maple seldom inward sound.

—Spencer's *Faerie Queene.*

SOUTH AFRICAN FOREST PICTURES.

The sun is high, and many a prying shaft
Slants through the branches of the thickest pines,
Whilst ever and anon, like golden lines,
The red pine-needles through the light fall soft.

* * * * * *

Where the breath of the ocean encumbers
The air with languorous balm,
And weaves o'er the forest that slumbers
The spell of its health-giving calm;
Where the spirit of Peace hath its dwelling,
And, rich round the wanderer's feet,
In the groves where clear waters are welling,
The dream-fragant lotus blooms sweet.

Down rocks that the lichen makes hoary,
The garlanded tendril-blooms trail
To the woods where the wing of the lory
The scarlet geranium strikes pale;
O'er the aloe the honey-birds quiver
Like emeralds, feathered with flame,
Whilst the kingfisher's plunge sends a shiver
Of light through the depths of the stream.

Sweet orchids in shadow reposing,
Sigh scents on the path of the bee;
Bright lilies in splendour unclosing,
Woo butterflies over the lea;
Soft moss, for a dryad fit pillow,
Droops thick over tree-trunk and stone
In the depths of each fern-brimming hollow,
Where the moistening sea's breath is blown.

O'er a league of fair woodland and meadow,
  Rich in flower and grass and soft fern,
Where the antelope couches in shadow,
  And the curlew pipes over the tarn,
Lie the infinite waters of wonder.

* * * * * *

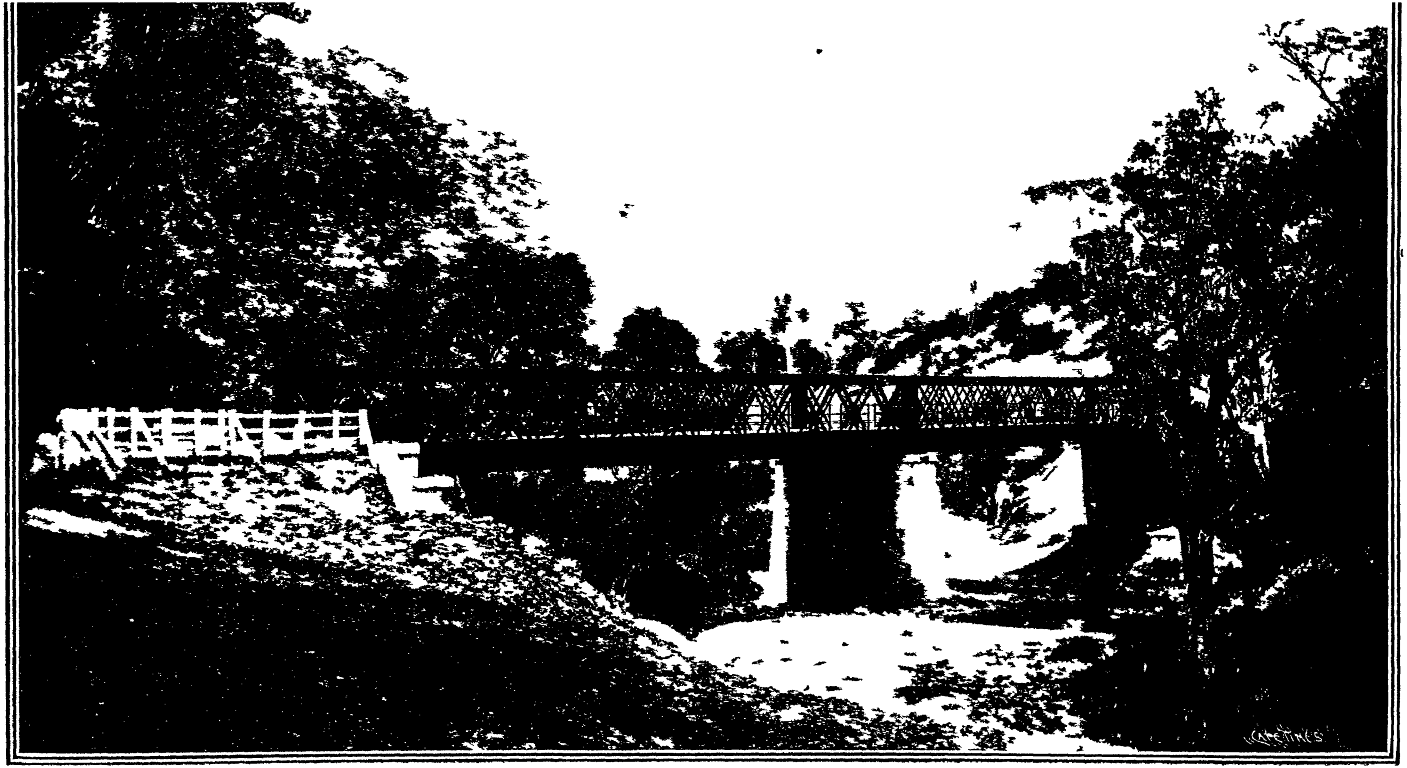
Amid this tangled forest's wealth of green
  A dead tree stands, and towers high above
The living, till its white limbs may be seen
  Clear-imaged out against the moving sea
  Of wind-swept foliage, twinkling merrily.

* * * * * *

The bush-buck barks, the horned owl
  Moans that the waning moon is late,
The hoarse baboon, with coughing howl,
  Flees from the leopard's eye of hate.

The loud pneumora sadly thrills
  Its love-song from the willow-bough,
And many a sharp cicada shrills,
  And many a dun-moth circles slow.

(W. Scully.)



Homtini Forest, Knysna.

(W B Baker)

IRRIGATION IN THE NORTH-WEST.

Report of the Director of Irrigation on his tour of Inspection.

(Continued from page 205.)

THE ZAK RIVER.

43. *Brand Vlei, Klippe Kraal, and Nels Kop Irrigation Works.*—The village of Brand Vlei, containing a population of 200, lies to the north of the Groene Punt Hill, round which the Zak River formerly flowed in two separate branches—the left branch passing to the west, and the right branch to the east of the hill (*vide* the accompanying sketch map). On the western branch, in a narrow, rocky poort about half a mile up stream of the village, an earthen dam has been constructed about 100 yards long and 18 feet high. Above the dam is a large flat vlei, the total area of which I estimate roughly to be five or six square miles. The original furrow for carrying water to the dam appears to have been a mere deepening of the western branch of the river, carried up to a point about five miles above the dam, where owing to the configuration of the ground the water brought down by the western branch naturally tended to find its way back to the main or eastern branch. What is now the main furrow for the supply of the dam has, however, a total length of 11 miles. It takes off from the main river at a point about a mile above the southern boundary of Nelskop North. This upper mile of its length appears to be a portion of the original western branch of the river, but across this branch, which is about 100 feet wide, a loose stone dam now holds up the water and turns it into an artificial channel, about 500 yards long, which carries the water into another natural channel. Five miles lower down this channel joins the furrow originally excavated for the supply of Brand Vlei. The dam, and the short length of artificial channel just below it, were constructed in 1900. The channel was not excavated to a sufficient depth. The obstruction offered to the flow of the water in the natural spill channel by the construction of the dam, has caused a serious deposit of silt in the reach above Nelskop North. In all probability the spill channel would by this time have silted up completely were it not that the dam—a mere temporary structure of stone and bush—broke soon after it was made. It has recently been re-made by some of the cultivators on Nelskop, as an escape weir over which a portion of the flood water can find its way back to the river. In this form it offers less obstruction to the flow of water during floods, and the channel above is less likely to be choked by silt.

44. Below the dam to Mile VIII., the channel in its excavated portions has a bed width varying unsystematically from 15 to 25 feet; the natural channel also is of very irregular section. There is no control of any kind over the water entering the furrow. In high floods it breaks back to the main river, at more than one point, especially at the sixth mile, where the furrow runs practically in embankment for a length of about 250 feet, and where the bank almost invariably breaches when any considerable volume of water finds its way into the furrow. In low floods the water does not rise sufficiently high to flood the lands in Nelskop and Klippekraal—for the furrow has to supply water to these lands as well as to Brand Vlei. The cultivators on these farms therefore throw earthen dams across the channel, with the result that in a low flood Brand Vlei gets no water, and that in a high flood, although the dams may be breached, they still offer sufficient obstruction to turn out the water on to the adjoining lands in uncontrollable volumes. This water soon finds an easy course back to the main stream, cutting on its way deep sluits in the irrigable lands.

45. At the eighth mile from its head, near De Kok's house, the furrow passes into Brand Vlei through a cutting in a low rocky nek. Between this nek and the dam, the furrow, which has a width of 6 to 10 feet, is now nearly filled with silt, but this does not appear to be a matter of much consequence, as the water after passing through the nek finds an easy passage across the vlei into the dam at Brand Vlei. When it reaches a height of 5 or 6 feet above the original level of the ground at the dam, it begins to flow back to the main stream over the wide nek on the vlei, between De Kok's house and Groene Punt Hill. Immediately above the dam there is a hole from which the material for its construction was excavated. Here, over a small area, the water has a depth of perhaps 10 or 12 feet when the reservoir is full; elsewhere it spreads in a broad sheet over about 3 square miles of the vlei, its depth varying from a few inches to 4 or 5 feet.

46. On the western side of the dam, excavated in the rock, there is an outlet which is closed by a small bank of earth. Through this outlet, when the time comes for sowing wheat, the shallow water is drawn off: and then the saturated soil of the vlei is sown and ploughed. At the same time the water which is drawn off through the outlet is used to moisten and prepare for sowing some of the lands below the dam. There is very little, if any, garden cultivation or perennial irrigation from the reservoir. Whatever may have been the original intention when the dam and furrow were made, these are now used chiefly, if not almost entirely, for the saturation and sowing of the vlei lands. And this no doubt is the most profitable way of using the water, most of which would evaporate if retained for any length of time in such a shallow reservoir.

47. From this brief description of the present state of the works it is evident that from an engineering point of view their main requirement is more efficient control over the water. This can never be obtained so long as the furrow conveying water for the low lands

in Brand Vlei is called upon to supply water directly, at numerous points along its length, to the high lands of Nelskop and Klippe Kraal. A channel graded to deliver water to Brand Vlei, with due regard to the safety and preservation of the lands in Klippe Kraal and Nelskop, cannot be made to deliver water directly to all the sowing lands in those farms. The most that it can be expected to do is to deliver water at the required level at a few points from which distributary channels can take off for the supply of the higher lands which lie along its course. Each of these distributary channels should be designed to draw off from the main channel a volume of water just sufficient for the area it has to irrigate, and its bed should be graded so that it may deliver the water at the required height for the irrigation of the fields adjoining it. To make the system of distribution perfect a masonry regulator, provided with piers and grooves in which regulating planks can be inserted, should be provided in the main channel below each of the distributary heads. But the cost of this would perhaps be greater than would be justifiable in the case of a canal which is utilised solely for flood irrigation, and which is in flood for a comparatively short period of the year. One or two falls or drops will no doubt be required in the main channel, and it is from above these that the distributary channels should, if possible, be taken off. But instead of constructing masonry falls in the loose alluvial soil, it will probably be cheaper to divert the main furrow for a short distance into the side of the hill, so as to obtain the required fall in a short length of rock cutting. There are one or two places in which it might with advantage be taken round and to the west of an outlying hill. The volume entering the distributary channel can be controlled to a certain extent by protecting its bed and sides for a short length near the head by dry stone pitching. More information will be required than I possess at present regarding the height and duration of ordinary floods in the river, and some further surveys must be made of the irrigable lands, before a proper system of distributary channels can be designed and constructed; but to illustrate more clearly my proposals I show on the accompanying plan of the farms a system of channel which from my inspection of the ground and from such levels and surveys as are available would appear to be suitable.

48. The first distributary channel must take off from the dug furrow near Mile I., below the escape dam referred to in paragraph 43. At about one quarter of a mile from its off-take it would join an old channel which formerly was the main supply channel for Brand Vlei. This channel runs at a higher level than the present furrow and will command the high lands in Nelskop North down to Mouton's dam. From Mile IV. the main furrow should be diverted to the left into the low land close to the foot of the hills, and Distributary Channel No. 2 would follow the line of the existing furrow for the irrigation of the remaining lands of Nelskop and a portion of Klippe Kraal, down to the sluit which has been formed by the frequent breaching of the bank just below Mile VI. of the main

furrow. Below this sluit the irrigation of Klippe Kraal would be affected by means of two or three small distributary channels.

49. In addition to constructing these distributary channels the main furrow must be properly graded and made of such a depth that an ordinary flood will not overtop its bank at any point. At Mile VI. especially, the bed must be lowered. The water which now breaches the bank at that point, and is gradually scouring away the soil on its course towards the river, will then be carried down the furrow on to the lands and into the reservoir at Brand Vlei.

50. These works cannot be put in hand until the necessary surveys have been made, and until detailed plans and estimates have been prepared and sanctioned. At present, and until the channel can be definitely aligned and calculations be made of their sectional areas, I cannot attempt to form even a rough estimate of the cost of the works, but I have no doubt that under proper management they will amply repay the expenditure that may have to be incurred upon them. Meanwhile the main furrow should be deepened for a length of about 400 yards below the point near Mile I. where it takes off from the natural spill channel of the river; and the bank at Mile VI. should be widened and strengthened and a more efficient escape weir be provided at its upstream end. The cost of these urgently required improvements will, at a rough estimate, amount to about £200.

51. There still remains the question of the management of the works; and here it will be necessary to make a brief reference to their past history, the records of which are buried in the voluminous files of three departments. In fact, the enormous mass of papers through which one has to wade in the search for information regarding these small works is in itself sufficient evidence of the trouble which they have caused to the administration, and of the necessity for a more simple system of management and a more direct form of control.

52. The village of Brand Vlei was laid out in 1876, and shortly afterwards the dam and its subsidiary works were constructed at a total cost of about £800, the whole of which was defrayed by Government. The Village lands proper consist of 182 building lots, each 400 sq. rds., and of 152 water erven, varying in size from 1½ to 3 morgen. In 1877, 35 building and 35 arable lots were sold, and realised £797 10s., or approximately the amount which had been spent upon the works. The building lots are subject to a quit-rent of 2s. 6d., and the arable lots to one of 5s. In 1880, five more arable lots were disposed of on quit-rents varying from 16s. 8d. to £1 10s. Of these, two have since reverted to Government. Thus there are now 39 holders of water erven, but of these I am informed that only six are resident in the Village. The commonage attached to the Village is 12,000 morgen in extent, and every erfholder has certain grazing rights.

53. From the very outset the success of the dam as an irrigation work was interfered with by the lease holders of Klippe Kraal and Nelskop, who persisted in damming the flow in the river for the

irrigation of their lands. In order to meet this difficulty, in 1881, the Government spent some £600 in constructing additional furrows, etc. At the same time the farm of Klippe Kraal, instead of being given out on lease to a single farmer, was let out annually in sowing plots to poorer cultivators who were given certain commonage rights. Eventually the farm of Nelskop North was dealt with in the same way. The result being that instead of one or two farmers, there were now some dozens of cultivators grabbing at the water on its way to Brand Vlei.

54. In 1889, Government, under Notice No. 506, published certain rules and regulations for the waterworks and commonage of the township of Brand Vlei. These rules provided for the appointment of five erfholders, one of whom should be Secretary and Treasurer. They also provided for the distribution of the water from the dam, and for the upkeep of the furrow leading from the dam. But no provision seems to have been made for the upkeep of the main furrow leading from the river to the dam, or for the control of its water, nor for the distribution of the water on the farms of Klippe Kraal and Nels Kop, over which the Brand Vlei Committee had no authority of any kind.

55. Subsequently, about 1890, Mr. Bain, then Hydraulic Engineer to Government, entered into an informal arrangement, whereby Mr. Erda, Secretary of the Brand Vlei Committee, was "to keep a sort of general supervision of the Brand Vlei and its adjuncts." He also was to collect revenue from lessees of sowing or grazing lands in the four farms (Brand Vlei, Klippe Kraal, Nelskop, and Verdwaal Vlei, the latter farm having been annexed to Brand Vlei), and to account for it to the Civil Commissioner of Calvinia. This arrangement in some respects worked satisfactorily. It certainly seems to have put an end for some time to the constant references to Government regarding the distribution of the supply and the upkeep of the works. On the other hand, during the five years in which the arrangement was in force, Government derived no revenue from the five farms containing an aggregate area of 38,252 morgen.* The receipts during these years, amounting in all to £1,003, was counterbalanced by the expenditure. The arrangement was terminated in 1896, when the Waterworks Committee seems to have fallen into abeyance, its place being taken apparently by a Village Management Board, and the allotment of the sowing lands in Klippe Kraal and Nelskop was placed in the hands of the Special J.P. at Brand Vlei. This is the arrangement now in force, and although it is stated that the area sown is often largely in excess of that allotted, it seems to be working satisfactorily as regards the mere allotment of the lands. But there is still no control over the distribution of the supply from the main furrow, across which dams are still made by the cultivators in the upper farms, to the detriment of Brand Vlei and to the serious injury of the lands in Nelskop and Klippe Kraal.

56. Nor is there anyone on the spot who is directly, or even indirectly, responsible for the maintenance of the main furrow. The

Brand Vlei Committee repair the bank at Mile VI. from time to time, but when anything serious occurs, a Government Engineer is sent for. In one recent case the engineer did not arrive in time, and certain leaseholders undertook and carried out the necessary repairs to the dam near Mile I., for which they submitted to the Government a claim of £75. During my inspection I was asked to examine the work. This I did, but as I was not aware of the condition of the dam before the repairs were undertaken, it was obviously impossible for me to make any accurate estimate of the expenditure which had to be incurred on the work.

57. In the farms of Nelskop and Klippe Kraal there are a number of buildings—about thirty in all—dotted at intervals along the foot of the hills adjoining the irrigable lands. As to the ownership of these buildings, I could obtain no information. Some of the inhabitants are of the better class—intelligent men who, I have no doubt, under more favourable conditions as regards the supply and distribution of water, would work the land to the best advantage. But with respect to the remaining occupants the following description written some five or six years ago appears to be generally applicable to-day :—

"I found living at Nelskop and Klippe Kraal some forty families, white and coloured, some in tents, some in raw brick flat-roofed dwellings, and about half-a-dozen Native squatters without any tents or house of any description, merely a wagon or bushes piled together, and apparently without any occupation whatsoever. All these people have either ploughed for themselves or for others, and are waiting for the water to come down. With perhaps two or three exceptions they are a miserable, poverty-stricken lot, for in the meanwhile they have little or nothing to do and eke out an existence as best they can."

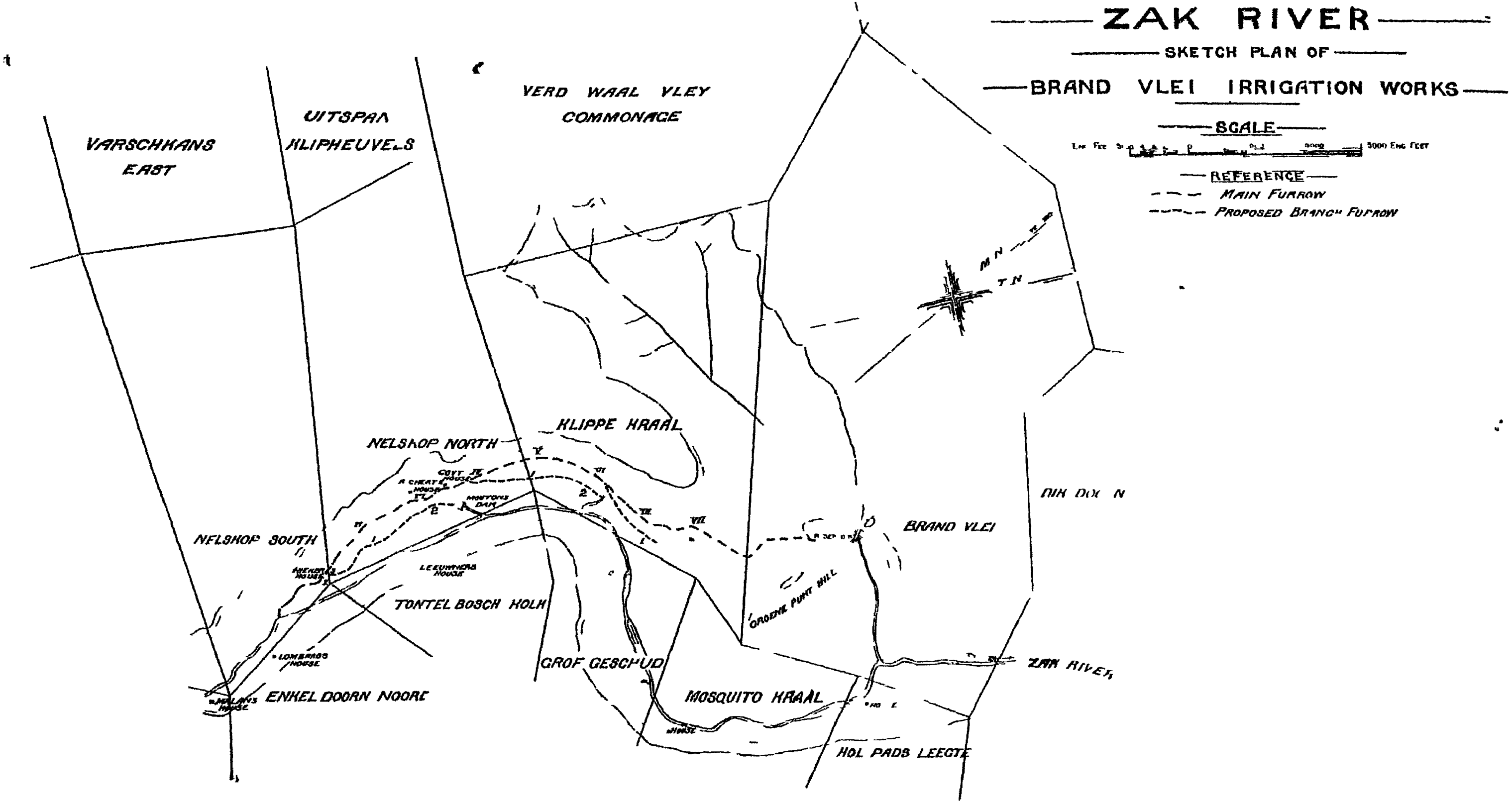
58. In 1897 the lands of the two farms, about 1,700 morgen in extent, were surveyed and laid out in 377 losts, averaging 4 morgen each. But no regard is paid to the beacons in letting out the lands. The measure in which the lands are leased out is the area on which a muid of seed can be sown. This is estimated at 300 yards by 160 yards or 4·8 morgen, that is about 1 morgen more than the measure adopted at Tontelbosch Kolk, where the soil is equally good. The rental charged is £2 10s. per mensem for cleared land and £1 10s. for uncleared. There are no records of the area sown, but the total receipts vary from nil to about £500 per annum. Apparently they average about £200, against an average expenditure of about £115. Nothing, it may be noted, is paid to Government for lands sown in Brand Vlei. Of these, only a small portion, if indeed any, lies within the boundary of the surveyed lots which were sold in 1877. I could get no information as to the area annually under crop.

59. It has been long recognised that the condition and management of these works is far from satisfactory, and in 1900, with a view to putting matters on a better footing, an engineer was sent to make a survey of the farms and to submit a report on the works. Unfortunately before his work was completed he had to

ZAK RIVER

SKETCH PLAN OF

BRAND VLEI IRRIGATION WORKS



leave owing to the disturbed state of the locality. My inspection was necessarily a brief one, but it was sufficient to impress me very favourably with the possibilities of this portion of the Zak River. This part of the country is still in the very early stage of its development, and until a better market is provided either by an increase in the population or by the advent of a railway there can be no very large increase in the area brought under cultivation. But having regard to the quality of the soil and to the results attained on other parts of the Zak River under somewhat similar conditions, I see no reason why in the near future 300 bags of wheat should not be sown on these farms in an average year, and the income derived from them should then certainly not fall short of £1,000 per annum, of which £300 at least should be clear profit.

60. I have, therefore, no hesitation in making the following recommendations:—

(1) An engineer should be sent to the spot as soon as possible to carry out at once the works referred to in paragraph 50, which are those most urgently required; and to complete the surveys with a view to the preparation of detailed plans and estimates for the general improvement of the works.

(2) The Government should undertake the maintenance of the furrow and subsidiary works from the head to the southern boundary of Brand Vlei.

(3) A suitable bailiff should be at once appointed, in whom should be vested full control over the distribution of the supply. He should also be responsible for the maintenance of the works and, under the direction of the Civil Commissioner, of the allotment of the sowing lands in Nelskop and Klippe Kraal, and for the collection of the revenue.

(4) One of the first duties of the bailiff should be to form a good labour gang from among the poor whites who are living at present in a state of idleness on the Government farms. The only hope for these people is to find them work in the slack season; and under proper management there is work enough to keep them employed, not only on improving the main furrow and constructing distributary channels, but also on the construction of field embankments or "saai dams." They should be paid partly in cash, but chiefly by tickets entitling them to the lease for a year of a certain area of sowing land. The holders of these tickets should have the first claim to the land.

(5) In a year in which, for reasons beyond the control of the cultivators, there is no crop, there should be no charge for the land leased for sowing. On the other hand, in good years, the crop should remain the property of the Government until the Government dues have been paid in full; and the bailiff should be empowered to sell by

auction any crop on which the dues have not been paid in full when it is ripe for cutting.

(6) Government should retain its title in the land on Nelskop and Klippe Kraal, and alienate none of it until the works have been placed on a satisfactory footing, and until the people can be safely entrusted to take over the works together with the land.

(7) Placing dams or other obstructions in the main furrow or its distributary channels should be prohibited (under a penalty). Very high lying lands which cannot be flooded except by damming the furrow should not be given out on lease.

(8) No one who is in arrears with his rent should be allowed to sow land or occupy any Government building.

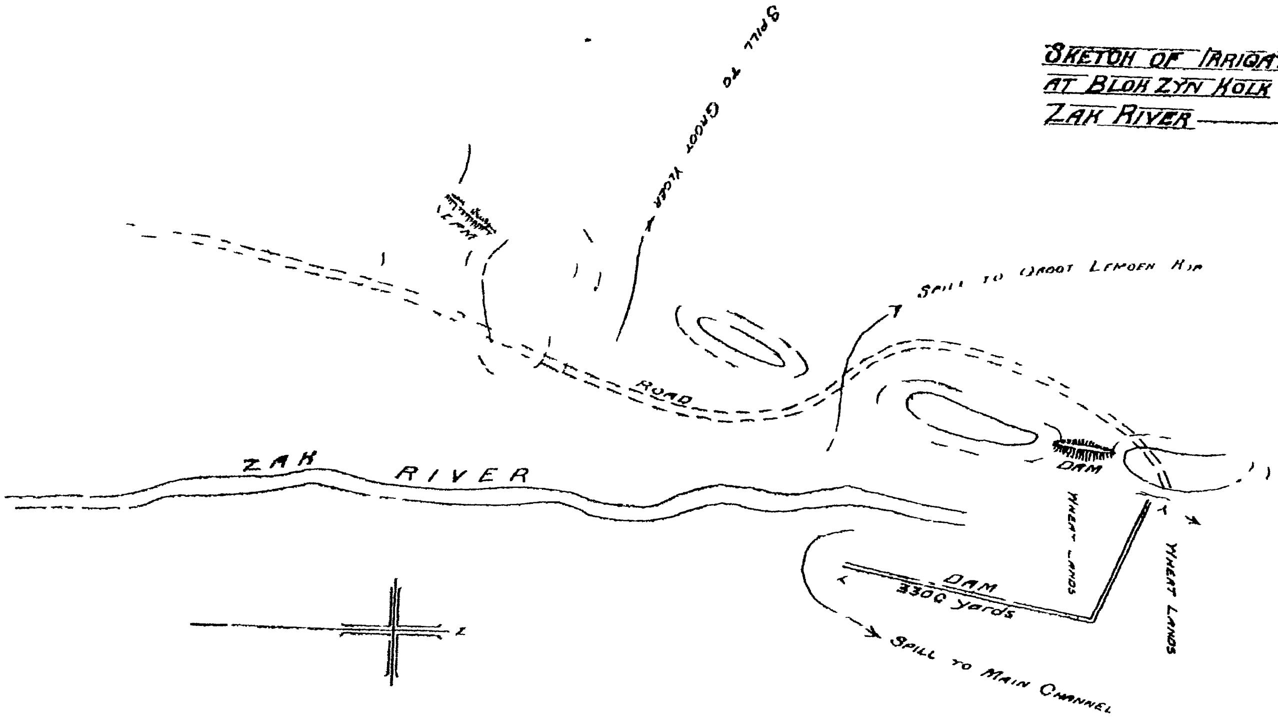
(9) Sub-letting should be prohibited.

61. There still remains the question of leasing out, for sowing, the lands on the commonage of Brand Vlei. These lands were apparently given out on lease for some years without any reference to Government, and the leasing by the Village Management Board is still allowed as a temporary measure, pending a final decision on the question. Theoretically, each holder of an arable lot in Brand Vlei is entitled to sow only his own lot, irrigating it from the dam. But as I have already explained, instead of holding the water back permanently in a shallow reservoir, the available supply can be utilised more profitably by drawing it off at sowing time, when the saturated land above the dam can be sown, as well as the lands below the dam which are saturated when the water is drawn off. Probably the best solution will be to fix the level of full supply in the dam and that to which the water can be drawn off, and to allow the land between those levels to be sown or given out on lease by the Village Board. Here, also, however, the lands must be accurately surveyed. To the water drawn off from the dam the erfholders of the arable lots appear to be entitled. But sowings made by them by means of this water should be limited to the lots purchased by them. For any additional land that may be sown, rent should be paid to Government.

62. I may add that a considerable area could be brought under cultivation on the farm of Mosquito Kraal (temporarily annexed to Brand Vlei Commonage) by taking out a furrow from the river on the farm of Grof Gerschud. But this need not be contemplated until the existing works have been more fully developed.

63. From Brand Vlei my route took me up the Zak River to Tontelbosch Kolk. I did not visit the lower reaches of the river until after I had been to that place and up the Fish River. It was not until I had proceeded some way up that river that I heard sufficient particulars of the large vlei at Block zyn Kolk to impress me with its importance, not only as an irrigable tract, but also as a factor in checking the flow of water toward the Rooiberg dam. It will, however, be convenient to finish with the main Zak River before dealing with its tributary the Fish River.

SKETCH OF IRRIGATION WORKS
AT BLOK ZYN KOLK
ZAK RIVER



64. *The reaches above and below Brand Vlei.*—For a distance of 20 miles above, and 24 miles below Brand Vlei, the Zak River runs in a valley, whose average width is about 1½ miles. In these reaches, one or two attempts had evidently been made in former days to turn out the river. There were signs of furrows here and there, but these have been abandoned owing, apparently, to the increased size of the channel of recent years. Thus at Onderste Doorns, where I was told that 20 years ago the leaders of a span of oxen would top one bank before the wagon was half way down the other, the channel has now a bed width of 120 feet and carries when in flood 12 feet depth of water. In a high flood the water spreads over the whole valley to a depth of four feet. The cost of turning out the river in this reach would be much greater in comparison to the area irrigated than in the case of the larger vleis at Tontelbosch Kolk, Brand Vlei, Blok zyn Kolk, and Lemoen Kop, on which all the water of the river can be fully utilised.

65. *Blok zyn Kolk.*—Five miles below Onderste Doorns the Zak River enters a vlei which covers an area of more than 200 sq. miles. Blok zyn Kolk, one of the farms comprised in this vlei, has recently been acquired by a syndicate, the managing member of which is Mr. Vice, to whom I am indebted for most of the following information. At Blok zyn Kolk, across the main channel of the river an earthern dam, 10 feet high in its highest part, has been constructed. On the west the dam ends in a shale outcrop, where an overflow is provided; on the east it runs generally parallel to the river, its total length being 3,300 yards. A flood which is more than sufficient to fill the dam spills to the east round its southern extremity, and on the west finds an outlet over the depressions separating the numerous bults, or shale outcrops, which lie on the left bank of the river, between it and the Groot Vloer. This year, after a drought of 17 months the river came down in January, in a good average flood, followed by a smaller flood in February. These flows partially filled the dam, and 50 bags of wheat have been sown —35 bags inside the dam and 15 bags below it. One bag is sown on 3¾ morgen. The system of cultivation is much the same as at Tontelbosch Kolk (*vide* paragraph 66), but the soil is more clayey, more difficult to work, and requires more water. A watering in August is necessary to give a return of fiftyfold. The ground below the dam was sown in the dry, after ploughing in the dry. Water was then let in and allowed to stand about six inches deep for three or four days, when it was drawn off. When the crop is four inches high it will receive another watering from water which has been retained in the dam. On an average, for every 100 bags of grain, 75 bales (280 lbs. each) of chaff are produced. The price of chaff at present is 27s. 6d., but in a good year it falls to 2s. 6d. per bale. The ground below the dam shows strong signs of brak. The subsoil at this place is a stiff calcareous clay. The flood of January spread over about 64 sq. miles of the vlei. The spill water on the left bank, flowing a foot deep and a mile wide, took four days to travel a mile. That on the right bank 2½ miles wide and 6 inches deep. Its water

just reached the big tree opposite Groot Lemoen Kop Homestead. This is the limit to which an ordinary high flood will spread. It is only a very exceptional flood like that of March, 1900, which traverses the length of the vlei. The whole valley, excepting the shale bults would then be flooded. Mr. Vice stated that the owner of De Struis farm had taken out a furrow for merely flooding the veld, and had thereby diverted the main stream away from his dam.

66. *The Fish River—Tontelbosch Kolk.*—The farms of Hoek Spruit and Middel Hoek Spruit, the property of Mr. Schalk van der Merwe, and two of his brothers, lie on the Fish River immediately above its junction with the Zak. On these farms, in the angle formed by the two rivers, lies the large and flat vlei of Tontelbosch Kolk, comprising at a rough estimate about 60 square miles of deep alluvial soil. The Fish River cuts into the vlei at its south-eastern corner. It drains a catchment area of 6,000 square miles. Some 25 miles upstream of the vlei, just below its junction with the Rhenoster, the river runs in a defined channel 100 feet wide and 15 feet deep, from which in an exceptionally high flood it spills over the adjoining lands. Like the Brak, this river did not exist in the time of the "voortrekkers." One of the oldest inhabitants informed me that, in his boyhood, where the Fish River now is, there was a small stream which never ceased to flow. Even now, as the river approaches the vlei it gradually loses its channel, and the water in its course to the Zak passes over the vlei in a shallow stream, except in a high flood like that of the 7th May, 1873, when the water is said to have filled the whole vlei to a depth of 6 feet. Mr. Schalk van der Merwe can only remember two years—1896 and 1903—in which the water of the Fish River did not join the Zak.

67. Before it reaches the vlei at a point where the channel is 45 feet wide, and 8 feet deep, the earlier flood water is diverted from the river by means of an earthen dam into a "kuil" or hollow, situated near the head of the vlei. Here it is held up, by a bank made ten years ago, to a mean depth of 8 feet over an area of about 450 acres. The bank is provided with two overflows, each 10 yards in length. When the kuil has been filled, the water is allowed to pass on to the vlei, where it is led into a series of large saai dams, each 3 to 6 feet in height, and holding up water over an area about 600 yards square. The bank is 1½ feet wide on top, inner slope 2 to 1, and outer slope 1 to 1. With one scraper, 50 lineal yards of a bank 3 feet high can, it is said, be made in a day. The vlei slopes towards the north at a general inclination of about 1 in 600 to 1 in 900. The usual flood season is from December to April. In that time two floods are received, and these are said to give a flow which lasts in all for about 20 days. One other flood is usually received between May and November, generally in August or September. If it were certain that the crop could be given a late watering in August or September, the best time for sowing would be in April. But experience has shown that the safest time is late in June or early in July. By sowing at this season a fair crop is assured even

if it receives no subsequent watering. When the time for sowing has arrived, the water of the kuil is drawn off to refill the saai dams, from which a good deal—probably about half the depth—of the water will have evaporated, or to give a watering to the partially dried margin. The bed of the kuil is then sown, and also the land submerged by the saai dams after the water has been drawn off from them and used to saturate the lands below. In a good year about 300 bags are sown. This year only one small flood was received, and that early in January, still there is sufficient water for sowing 100 bags. On the day of my visit to the farm, fourteen double or treble-shared ploughs were at work, each drawn by a span of ten horses or mules. As many as forty-one ploughs have been seen at work at one time on the plain in front of the homesteads. In the thoroughly saturated soil, fertilised by silt deposit from the river, the expense of cultivation is reduced to a minimum. The seed is scattered lightly over the land, one bag sufficing for 3½ to 4 morgen. When the quality of the ground is poor and the time of sowing late, the seed is sown more closely. After sowing, the land is ploughed to a depth of 4 or 5 inches, or 8 inches deep if there is a strong growth of grass or weeds. It is then harrowed and rolled. A flood in August or September will, it is said, ensure a return of fifty to sixty-fold. The kuil alone yields 2,000 bags, and in a favourable year the total yield from the 1,200 morgen which are under cultivation is about 8,000 bags (200 lbs. each) of grain, and 6,000 bales (300 lbs. each) of chaff. After reaping, a favourable flood, without any ploughing or preparation of the ground, will give a second or "opslaag" crop, from the germination of the seed which has fallen to the ground during the process of harvesting. The ordinary selling price of wheat on the farm is from 30 to 40 shillings per bag. But the limited market is easily congested, and in one year when the out-turn was much in excess of the demand the price fell to 14s. per bag. The land can readily be let on the half system, but as a rule any land which is let is given out to relatives and neighbours, and a third of the produce is taken as rent.

68. An indication of the rate at which silt is being deposited on the vlei is afforded by the fact that a row of stables at Tontelbosch Kolk were built in 1884 on ground which was then 1½ feet above the general level of the adjoining flat. The vlei is now one foot higher than the ground near the stables, that is, silt has been deposited to a depth of 2½ feet in 20 years.

69. *Oude Muur and Brassefontein.*—Upstream from Tontelbosch Kolk Mr. J. van der Merwe diverts the river in two places for flood irrigation to the farms of Oude Muur and Brassefontein, on which, in a good year, 120 bags of wheat are sown. The diversions are made by constructing mere dams of silt across the river up to the full height of the banks. These turn into furrows all the water of a very small flood, but in an ordinary flood they are overtopped and carried away.

70. *Brassefontein Dam.*—A dam at Brassefontein has been constructed by Mr. van der Merwe, of Oude Muur, across a tributary of

the Fish River. The dam, which is about 1,000 feet long and 15 feet high in its highest part, was constructed chiefly by means of a Government loan of £1000. Within a year of its completion it was washed away for a length of 270 feet by a flood which rose to a height of only 7 to 10 feet against the dam. It was repaired, and on March 25th, 1900, the same rainfall which led to the breach of the Rooiberg dam filled the reservoir of the Brassefontein dam to a height of 10 feet in 15 hours. The dam breached in two places. The Southern breach is 33 paces wide and the northern 48 paces. From my examination of the site I am of opinion that the southern breach was due to leakage under the dam, owing to the site not having been properly cleared of loose and fissured material before the construction of the dam was begun. At the northern breach the water apparently found its way through the body of the dam at a height of some feet above the bed, but there was nothing to account for the breach except perhaps that the material composing the dam at this point had not been properly laid and consolidated. Mr. van der Merwe, whom I met shortly afterwards, informed me that such was the case. I advised him that, when repairing the breaches, all loose material and fissured rock lying between the centre line of the dam and the upstream toe should be removed. The drainage from a catchment area of 94 square miles is said to find its way into this reservoir. The overflow was designed 320 feet long. With this length of overflow the top of the bank should be at least 5 feet above the crest of the overflow and when the bank is being repaired it would be advisable to raise it that height. I may note that no water was used in constructing this dam, nor do I think that the addition of water is necessary in the case of a dam of this height if the material is thrown up in layers, thoroughly pulverised, and properly consolidated by rolling or trampling. The thickness of the layers should not exceed 6 inches.

71. *The Drift.*—About 23 miles above Tontelbosch Kolk the Little Rhenoster joins the Fish River. Across the Little Rhenoster, immediately above the junction, a substantial weir has been built on a reef of rock which crosses the river at this point. A furrow takes off on the left bank, but very little, if any, use appears to be made of it, although it commands a large area of good land. About five miles above the junction Messrs. F. and W. van der Merwe on their farm, The Drift, have diverted the Fish River on to both banks by means of a well-constructed stone and wire weir. The weir is founded on an outcrop of shale. It is 240 yards long and 6 feet high; it has a base width of 21 feet and a down-stream slope of 2 to 1. The left bank furrow has a bed width of 5 feet, and is 1½ miles long. That on the right bank has a bed width of 25 feet, and delivers water on to the country at a distance of 700 yards from the intake. Both furrows are used to fill large "saai" dams, a number of which have been very skilfully made. These dams, each half a mile to a mile in length, run for the most part at right angles to the stream from the high bank of the river on one side to a flat "bult" or low hill of shale on the other. These "bults," which are a distinctive feature

of this part of the Fish Valley, afford excellent sites for passing the overflow water round the ends of the dams. The banks have a top-width of 3 feet, an inner slope of 4 or 5 to 1, and an outer slope of 2½ to 1. The slopes here and at Tontelbosch Kolk are not pitched. The upper dam on the right bank holds up 5 feet of water, and submerges the ground for a length of 1½ miles above it. It is used for the same purpose as the kuil at Tontelbosch Kolk, that is, water is led into the smaller "saai" dams below it. Above one of these dams the ground is so flat that water held up to a depth of 18 inches extends back to a distance of 1,500 yards. In a year of average flood 120 bags. covering about 450 morgen, have hitherto been sown, and in addition a large tract of veld has been put under flood irrigation. When the new dams, now under construction, have been completed, the area under wheat will be considerably increased.

72. *Brandwacht and Farms above.*—By means of works similar to those on The Drift farm, and constructed, I understand, at an earlier date, Mr. F. van der Merwe, M.L.A., sows about 100 bags of wheat and irrigates a large area of veld. His left bank furrow, in addition to filling "saai" dams and flooding an ostrich camp, conveys water into a large dam which has been constructed at Swalkrantz. This dam, which is situated four miles from the intake of the furrow, is 1,500 yards long and 12 to 15 feet high, with the slopes protected by pitching. In addition to the supply from the river, it receives the drainage from a local catchment, which extends back for a distance of 24 miles. Above Brandwacht, in a length of about 12 miles, the river is diverted in four places by means of silt dams similar to those on the farms of Oude Muur and Brassefontein.

73. *Brak Lands and Vloers.*—In many tracts along the Fish River, more especially between Oude Muur and Brandwacht, the ground shows signs of brak. but the subsoil drainage being unobstructed, they disappear after one good flooding. The first crop sown in such lands is below the average, but subsequent crops are, I was informed, quite as good as those sown in lands free from any sign of brak. There are also, both on the Fish River and at Block zyn Kolk, many bare patches of ground, locally known as "Vloers." They are covered with a deposit of fine clay, in which no seed will germinate until the surface has been broken. These vloers are said to produce excellent crops of wheat when brought under the plough.

74. *Prospects of extending irrigation.*—From observations, and from such information as I have been able to collect in the course of a tour, which was necessarily more rapid that I would have wished, I find that the total area under flood irrigation from the Fish River and its tributaries, and from the Zak River below its juncture with the Fish, may be roughly estimated at 8,000 acres. This includes only the area under cultivation, and is exclusive of flooded veld. My tour did not embrace the Zak River above the junction, but I was informed that on this portion of the river there is only one flat—Wal Kraal—of any considerable size, where a few hundred acres are under irrigation. Taking the whole Zak River, probably not more than

9,000 acres are under cultivation by means of flood water. Of this, about two-thirds, or 6,000 acres, are on the Fish River. The total area of irrigable vlei land may be roughly estimated at 300,000 acres. The area that can actually be put under irrigation will depend upon the volume of flood water and upon the volume required for each acre of cultivation. On neither of these points is the information sufficient for a reliable estimate of the total area that could be irrigated in years of ordinary rainfall. No observations have been made of the flow in the river, nor of the volumes used in irrigation. To have such observations made in the case of a river which is in flow only for short periods and at unknown intervals, is not a simple nor an inexpensive matter. Of the available flow a very rough estimate can, however, be made by considering the catchment area, the rainfall, and the probable run off.

75. Above the large vlei at Lemoen Kop the Zak River has a total catchment of about 18,250 square miles, made up as follows:—

	sq. miles.
Fish River	6,000
Upper Zak (above junction with Fish) ...	7,250
Lower Zak	5,000
Total	18,250

Over the catchment of the Fish, the mean annual rainfall may be taken as 7 inches, with a maximum at any station of 9½ inches; over the Upper Zak as 8 inches, with a maximum of 10½ inches; and over the Lower Zak as 6 inches, evenly distributed over the catchment. From the catchment of Van Wyk's Vlei, which, as near as can be judged from the best available map, covers an area of about 800 square miles, with a mean annual rainfall of 6½ inches, the ordinary run off is about 200 million cubic feet, or 1·66 per cent. of the rainfall. From the Fish and Upper Zak, with rainfalls of 7 and 8 inches, the runs off may be estimated at 2 and 2½ per cent. respectively, and from the Lower Zak at 1½ per cent. These percentages give for the Fish River a run-off of 325,000 cubic feet; for the Upper Zak 464,000 cubic feet; and for the Lower Zak 200,000 cubic feet per square mile of catchment.

76. With regard to the volume of water used in flooding the land, all we know is that under what appears to be the most economical system, water is held up in the saai dams to a mean depth of 1½ feet. Rather more than half of this depth, equivalent to about 80 per cent. of the volume of water, is evaporated and absorbed. Again in order to prepare for sowing the partially-saturated land, lying along the margin of the submerged area, a 6-inch watering is usually required over, say, one-third of the area, equivalent to 2 inches over the whole area, or allowing for losses by evaporation, etc., from the catchment dam, which supplies this second watering, say 6 inches, over the whole area. This gives a total depth of 2 feet. About 20 per cent. of the water originally stored in the saai dams is used for

saturating additional land below them. This, however, may be taken roughly as equal to the loss by percolation from the channels and from the dams while they are being filled. The depth of water used under the most economical system may be taken, therefore, as 2 feet; and the average volume used per acre under all systems cannot be estimated at less than 100,000 cubic feet per acre.

77. Ordinarily, not more than two-thirds of the total flow in the river appears to be available for bringing the land under cultivation. The balance comes at a time when it can be more profitably employed in irrigating the standing crops, or it forms part of a flood which is too great to be fully utilised. The area irrigable with the flow available from each square mile of catchment may thus be estimated roughly as 2¼ acres for the Fish River, 3 acres for the Upper Zak, and 1⅓ acres for the Lower Zak. Adopting these figures, the total area, in round thousands, for which water would be available, is as follows:—

	Acres.
Fish River	13,000
Upper Zak	22,000
Lower Zak	7,000
Total	42,000

78. This estimate must be regarded as a mere rough approximation, but it is sufficient to show that water is not likely to be available for more than a comparatively small portion of the 300,000 acres of good alluvial land which is to be found along the Zak River at and above the large vlei at Block zyn Kolk. On the Rhenoster and Fish Rivers alone, excluding the large vlei at Tontelbosch Kolk, there are at least 60,000 acres of good irrigable land, for not one third of which is water likely to be available. On Tontelbosch Kolk and adjoining farms lying near the junction of the Zak and Fish Rivers, there are another 60,000 acres—an area sufficient to utilise far more water than is likely to be brought down in an ordinary year by the Upper Zak, the water of which can probably be diverted on to banks from a point above the junction. Given a sufficient market, wheat could be sold profitably along the Fish River at 15s. per bag; and a railway along that river, connecting with the main railway system in the central districts of the Colony, would give such an impetus to irrigation in this locality that, in all probability within a very few years of its construction, every available drop of water would be utilised. And it is along the Fish River and in the vicinity of its junction with the Zak that the water can be used to the greatest advantage. The very name of the Zak River implies a loss by soakage as the water flows down the valley. Moreover, the looser soils in the upper portions of the valley require less water, and are easier to cultivate than the finer and more compact soils of the lower reaches. Under these conditions it is needless to say that sooner or later, and whether a railway is constructed or not, disputes are bound to arise with regard

to the use of the flood waters. How these disputes can best be avoided is a difficult question which will have to be fully considered in the near future.

79. *Surveys and flow observations.*—No proper distribution of the water amongst the various irrigators will, however, be possible, until a contoured survey has been made of portions of the river valley, showing the irrigable and irrigated lands, and the existing works in each farm. Until this has been done, and until the depth of water in the river and the flow have been gauged at various points, I should hesitate to recommend any interference with the system of irrigation now in force, even as regards the crude silt dams which are thrown across the Fish River at five or six places. The surveys should for the present be confined to the Fish River, from Leeuw Drift to the Zak junction, a distance of 50 miles; to the lands in the neighbourhood of the junction, and to Brand Vlei. Gauge posts for recording the height of the river should be erected at the Drift, Nelskop, and Onderste Doorns. The necessary surveys and observations will be put in hand as soon as possible.

80. *A railway the chief requirement.*—Of the measures which Government might adopt for the development of flood irrigation in this valley, the construction of a railway would undoubtedly be the most effective. In connection with their actual irrigation works the people require very little, if any, assistance. Their own intelligence and experience, with the help of valuable assistance from the late Mr. McConomy, of the P.W.D, have led them to adopt a system of irrigation which makes the best and most economical use of the water. The want of a market has been the only hindrance to the full development of that system up to the limits of the available supply. The possibility of bringing under flood irrigation forty to fifty thousand acres of land may not in itself justify the construction of a railway to these parts, but it will at least be a strong additional argument in favour of it.

81. *Storage not recommended.*—The question of storing the water of the Fish River was occasionally discussed during my tour. There is more than one place along its course where a low earthen embankment would impound a considerable volume. In my opinion nothing of the kind should be attempted. With so much land available in close proximity to the river, the waters will be used more profitably in flood irrigation and to more general advantage than in perennial irrigation. On the Brak River, where the area of good flat land in the immediate vicinity of the river is probably small compared with the volume of water, storage may be advisable. Here I would not recommend it.

CALVINIA TO CERES.

82. *The Oorlogs Kloof River.*—About 12 miles from Calvinia the road from the Drift leaves the valley of the Zak and enters that of the Olifants River. In the Valley of the Oorlog's Kloof, a tributary of the Olifants, immediately to the east of Calvinia, there is some flat

land on the town commonage where "saai" dams could be profitably made, and the river turned into them when in flood. Close to Calvinia, on the farm of Hooge Kraal, Mr. Van Dyk has diverted the river on to the left bank by means of a good masonry dam, 60 feet long and 5 feet high, and has put 100 acres of barley, wheat, and lucerne under irrigation. On the right bank also, close to the town, where the water is only 16 feet from the surface, he has sunk four wells, from which, by means of Noria pumps, water is drawn for the irrigation of fruit, potatoes and wheat. Even after such a prolonged drought, these wells can be worked continuously for eight hours a day. Mr. Van Dyk informed me that with irrigation, fruit and potatoes yielded a good profit, but that if put on the market the wheat crop would not repay the cost of lifting the water.

83. *The Bosch River.*—On the Bosch River, between Calvinia and Elands Vlei, there are large stretches of vlei land suitable for saai dams and flood irrigation, especially at Witte Vlaakte and on the Government farm of Draai Kraal. The use of saai dams is gradually extending into this part of the country. On Witte Vlaakte six bags of wheat have recently been sown on some excellent land which had been saturated by means of such dams.

84. *The Doorn River.*—At Elands Vlei, on the farm of Mr. Andrew Hough, 60 morgen are under irrigation from the Doorn River, and produce wheat, oats, and fruit for home consumption. There is water available for a much larger area, especially in the winter months; but there is no market in this sparsely populated tract. At Taaibosch Kraal, where the Doorn emerges from the Cedar Bergs, a weir about 300 feet in length, and 30 feet high, built across a sandstone gorge, would divert water into the valley of the Dwequa River, where there are about 5,000 acres of good irrigable land. The Dwequa is said to be in flow about twice in the year, and then only for short periods. The Doorn has a catchment of more than 1,000 square miles, and carries a large volume throughout the winter months. Even in the summer there is said to be a considerable flow past Taaibosch Kraal, very little of which reaches Elands Vlei owing to the gravelly nature of the river bed. A survey of this site should certainly be made during the summer months when the river is low. I understand that there are few, if any, places below Elands Vlei where this river could be utilised ; but the whole valley of the Doorn River to its juncture with the Olifant should be examined.

SUMMARY.

85. My main conclusions and recommendations may be briefly summarised as follows:—

(1) *The Brak River.*—This river can be profitably diverted for the irrigation of 5,000 acres of excellent soil on Tigerpoort Vlei. It may be possible to divert some of its water into the Houwater dam at a reasonable cost, but

further surveys are necessary before this can be definitely determined. The area of good vlei land in the immediate vicinity of this river is probably insufficient to admit of the whole of the available supply being utilised in flood irrigation, and in order to utilise the whole of the supply it may necessary to resort to storage works.

(2) *The Orange River.*—Surveys should be made to ascertain the possibility of commanding the alluvial lands on the Government farms of Staf Kraal and Keuken Draai, without going to the expense of constructing the weir across the river; and to determine the cost of providing about 1,400 acres of irrigation in a part of the country in which there is at present no cultivation of any kind.

(3) Surveys should be made of the Orange River and its alluvial lands from Upington to the Augrabies Falls, in order to ascertain the possibility and probable cost of protecting the irrigable lands at Upington and Kakamas against encroachment of the river; and of bringing under irrigation the long stretch of islands which extend from a short distance below Upington down to the Falls.

(4) These islands, so far as I can see at present, offer the best prospect for utilising profitably the waters of the Orange River on an extensive scale. They comprise a large area of extremely fertile soil, much of which is above or very little below the present high flood level of the river. The questions of their ownership, and of the riparian rights attached to the adjoining farms, should be settled as soon as possible.

(5) Gauge posts for recording the height of the river should be erected at Buchuberg, Upington, and Kakamas.

(6) *The Rooiberg Dam.*—Owing to the uncertainty of a supply which is dependent upon a scanty and precarious local rainfall, it would not be advisable for Government to repair the dam at Rooiberg with the object of forming an irrigation settlement, or to allow anyone else to do so. As an adjunct to stock farming the dam would, however, probably prove a useful work. It, and the adjoining farm, should be sold under conditions which will prevent their being utilised for the formation of an irrigation settlement until it is known that the supply of water is sufficiently assured.

(7) *Van Wyk's Vlei.*—The advent of the railway to Carnarvon is likely to have an injurious effect upon the village of Van Wyk's Vlei, unless measures ars taken to increase the yield of the present staple crops, or to introduce other crops. In order to increase the yield the cultivated area might be extended, so that at least half the land may lie fallow every year. The lands might also be improved by fertilising them with the silt of the Carnarvon River, the water of which might also be held up in saai dams in.

order to prepare the land for sowing, and thus save at least one watering from the dam.

(8) *Saai Dams and Wells.*—In many of the minor valleys the farmers could grow sufficient fruit, vegetables, and grain for their own household and farm hands, by constructing small saai dams and sinking wells, as has been done so successfully at Uitspan Kop and Abiqua Puts. It is on works of this kind that many large tracts in the Zak Valley will have to depend for their irrigation.

(9) *Brand Vlei.*—To the work at Brand Vlei certain urgently required improvements, estimated to cost about £200, should be put in hand at once. Surveys should be made and estimates prepared for remodelling the works so as to ensure a proper distribution of the supply along the length of the furrow. See also paragraphs 60 and 61.

(10) *The Zak River.*—The system of flood irrigation which has been adopted by the farmers along the Zak River utilises the available water supply in what appears to me to be the best possible way. At present, owing to the limitations of the local market, the supply of water is ordinarily more than sufficient for the whole area under cultivation. The area of good irrigable land in close proximity to the river is, however, largely in excess of that for which water is available, and sooner or later disputes will arise over the distribution. These it will be necessary to guard against, and to ensure that the water is distributed fairly and to the best benefit of all concerned. With this object certain surveys should be made of portions of the valley, and gauge posts should be erected at suitable points along the course of the river. The want of a market is the only real hindrance to the full development of the present system up to the limits of the available supply, and, at the best, the extension of irrigation along this river will be a slow process unless a line can be constructed to connect it with the main railway system of the Colony.

(11) *The Doorn River.*—This river carries in the winter a large supply, a portion of which could probably be utilised in the valley of the Dwequa for the irrigation of about 5,000 acres. The site should be surveyed, and the possibility of utilising the river at points lower down in the valley should be investigated.

I cannot close this report without some reference to the hospitality and assistance which we received from the farming community throughout our tour. There are many pleasant details of our journeyings which will long be remembered though they can find no place in a formal report. As an instance of the readiness with which assistance was rendered to us I may mention that on one occasion I expressed to my host regret that I had not visited a spot a hundred miles away from his homestead. He at once made arrangements to take me there and back, and in five days he conveyed me, free of charge, a distance of 240 miles. This is only one of the innumerable instances of cordial assistance rendered to us on our way. To Mr. Litchfield also, who accompanied me throughout the tour, I am indebted for a great deal of valuable information and for the excellent arrangements made for our journey.

Rainfall Return for Kenhardt from November, 1879, to September, 1904.

Year.	November		December		January		February		March		April		May		June		July		August		September		October		Total	
	Rain-fall	No. of days	Rain-fall	No. of days	Rain fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days	Rain-fall	No. of days
	in.		in.		in.		in.		in.		in.		in		in.		in.		in.		in.		in		in.	
1879-80	0·00	0	0·00	0	0·00	0	2·30	4	0·10	1	0·00	0	0·01	0	0·00	0	0·00	0	0·30	2	0·00	0	0·10	1	2·80	8
1880-81	0·20	2	0·27	1	0·65	3	0·76	4	2·34	5	0·77	1	0·17	1	·18	5	0·00	0	0·00	0	0·03	1	0·71	1	6·11	27
1881-82	0·00	0	0·00	0	.		...	..	0·46	2	0·12	1	0·00	0	0·16	2	0·38	1	0·11	1	·53	1	0·00	0		
1882-83	0·00	0	0·83	3	0·00	0	0·33	1	0·00	0	1·73	5	0·09	1	0·00	0	0·01	0	0·00	0	0·06	1	0·16	2	3·20	13
1883-84	0·19	1	0·00	0	2·35	4	0·00	0	0·00	0	0·27	1	0·55	2	0·30	1	0·00	0	0·00	0	0·00	0	0·00	0	3·66	9
1884-85	1·06	2	0·00	0	0·00	0	3·30	2	3·00	1	0·75	1	1·25	5	0·00	0	0·00	0	0·00	0	0·00	0	1·00	1	10·36	15
1885-86	0·00	0	0·00	0	0·37	1	0·00	0	1·75	3	0·00	0	0·00	0	0·00	0	0·00	0	0·75	2	0·00	0	0·10	1	2·97	7
1886-87	0·40	2	2·50	1	0·00	0	1·55	4	0·95	2	0·69	3	0·87	1	0·39	1	0·24	2	0·00	0	0·00	0	0·15	1	7·56	23
1887-88	0·70	2	0·00	0	0·00	0	0·30	3	0·54	4	·34	2	0·40	2	0·25	2	0·00	0	0·10	1	0·76	3	0·15	2	3·59	21
1888-89	0·00	0	0·00	0	2·20	2	1·92	3	0·00	0	1·02	2	0·00	0	0·00	0	0·00	0	0·00	0	0·00	0	1·31	1	6·45	11
1889-90	0·00	0	0·00	0	0·00	0	0·28	2	3·38	5	2·48	5	0·41	1	0·46	1	0·00	0	0·00	0	0·00	0	0·70	3	7·71	17
1890-91	0·82	3	0·90	0	0·65	4	2·28	3	0·07	1	0·79	3	0·49	2	0·07	1	0·00	0	0·65	1	0·03	0	0·51	2	7·26	20
1891-92	1·44	3	0·00	0	1·78	4	0·00	0	1·79	6	1·02	4	·59	2	0·00	0	0·05	1	0·00	0	0·00	0	0·78	3	7·15	23
1892-93	0·00	0	0·00	0	2·00	3	0·73	2	1·90	7	0·24	1	0·19	1		...	0·56	1	0·04	1	0·12	1	.	..		...
1893-94	...	...	..		0·14	1	2·53	9	1·28	7	1·03	2	0·88	4	0·76	2	0·00	0	0·00	0	0·00	0	1· 0	2	...	.
1894-95	0·22	1	0·35	2	0·35	1	0·27	3	0·82	1	3·52	5	0·00	0	0·00	0	0·00	0	0·00	0	0·00	0	0·00	0	5·53	13
1895-96	0·31	1	1·44	3	0·00	0			..	...	0·06	1	0·56	2	0·00	0	0·00	0	0·01	1	0·00	0	0·00	0	...	...
1896-97	0·27	1	1·99	2	0·80	3	0·25	1	0·00	0	0·16	2	0·18	3	0·00	0	0·00	0	0·00	0	0·00	0	0·00	0	3·65	12
1897-98	0·00	0	0·00	0	1·35	1	1·69	8	0·73	2	0·96	4	0·12	2	0·00	0	0·18	1	0·00	0	0·20	2	0·37	2	5·60	25
1898-99	0·00	0	0·00	0	0·12	2	0·98	6	1·33	6	1·02	6	0·84	5	0·51	2	0·59	2	0·00	0	0·29	2	0·56	4	6·24	35
1899-00	0·04	1	0·50	2	0·50	1	1·26	3	2·99	3	1·76	5	0·00	0	0·15	2	0·53	3	0·32	2	0·00	0	0·08	1	8·34	23
1900-01	·00	0	1·58	6	0·03	1	0·39	1	0·79	8	0·30	6	0·00	0	0·03	1	0·26	1	0·00	0	0·76	1	1·67	3	5·81	31
1901-02	0·01	1	0·11	1	0·10	1	0·42	3	0·58	6	0·13	2	0·00	0	0·34	3	0·00	0	0·03	1	0·88	5	0·18	2	2·78	25
1902-03	0·00	0	0·09	3	0·10	1	0·28	2	0·00	0	0.04	1	0·17	2	0·03	1	0·06	1	0·01	1	0·00	0	0·00	0	0·78	12
1903-04	0·00	0	0·03	1	1·33	6	2·51	7	0·45	3	0·05	1	0·16	1	0·06	2	0·00	0	0·00	0	0·00	0	..	...	..	...
																					Average for 20 years				5·4075	18·5

THE STELLENBOSCH WINE SHOW.

ANALYSIS OF PRIZE WINES

In connection with the report on the Wine Show held in October, 1904 published in the *Agricultural Journal* for November the subjoined analyses of the prize wines made by the Government Analyst are herewith published for general information.

Most of the wines were made in the general way. It was, however, observed that many of the Hermitage wines were of too light a colour, which was ascribed to the fact that so many Hermitage plantations are very young still, and yield an excessive amount of grapes and it is hoped that with increasing age the quality of our Hermitage wines will improve, and more and more assume the character they had before such vines were by necessity grafted on American Stocks.

In the classes "Green Grape, Sherry Type," "Green Grape, Hock Type" some wines took prizes which were entirely fermented without husks and whose fermentation had been purposely delayed for 48 hours by addition of "Sulphite of Potassium."

Airing the cellars well during night, the temperature, of the vatted must fell appreciably and when the desired degree of temperature was approximately obtained, fermentation was introduced by means of a starter prepared about a week before the beginning of the vintage and kept going whilst the vintage lasted.

It appears that the wines produced in that way gave great satisfaction to the trade, as a purchaser of same writes as follows:—"The light wines we consider to be of a very superior quality; in our opinion vastly better than the wine made in the ordinary way. They are well fermented, pure healthy wines Speaking generally we are very well satisfied with them and would like the same system adopted in the making of the wines of a heavier type.

C. Mayer,

Secretary, Western Province Board of Horticulture.

Description of Sample	Prize.	Alcohol per cent. by Volume.	Proof Spirit.	Extract per Cent.	Total Acid per Cent.	Volatile Acid per mil
Cabernet Sauvignon.						
F J Versfeld, Klassenbosch ..	1st	11·07	19·40	2·436	·570	·624
Groot Constantia	2nd	11·44	20·04	2·159	·525	·570
Hermitage.						
T. de Waal, Vlottenberg	1st	11·26	19·73	2·441	·532	·660
Myburgh Bros., Mulders Vlei	2nd	13·10	22·96	3·011	·532	·624
High Constantia Estate	3rd	12·58	22·06	2·181	·487	·516
Pontac						
H. Cloete, Alphen . ..	1st	12·45	21·80	2·946	·600	·711
Green Grape—Sherry Type						
P. A Myburgh, Eerste River	1st	14·35	25·09	2·249	·577	·666
H. J. Joubert, Vlottenberg .	2nd	12·96	22·71	2·224	·652	·774
Roux Bros , Vlottenberg ..	3rd	12·22	21·42	2·353	·652	1·072
Stein—Sherry Type						
Louw Bros , Vlottenberg .	1st	12·87	22·55	2·202	·499	·586
M L. Neethling, Stellenbosch .	2nd	11·79	20·65	2·462	·675	·474
P. A. Myburgh, Eerste River ..	3rd	14·74	25·83	2·175	·559	·822
Green Grape—Hock Type.						
J D. Krige, Stellenbosch ..	1st	11·35	19·89	2·050	·634	·768
T de Waal, Vlottenberg ..	2nd	12·05	21·11	2·034	·656	·792
M. L. Neethling, Stellenbosch ..	3rd	11·44	20·04	2·392	·667	·567
Stein—Hock Type.						
Louw Bros , Vlottenberg ..	1st	12·68	22·22	2·008	·585	·780
M. L. Neethling, Stellenbosch	2nd	11·70	20·50	2·376	·626	·480
S. van Renen, Constantia Vale ..	3rd	13·62	23·86	1·925	·622	·495
White Wine—Sherry Type						
J. J. de Villiers, M.J.'s son, Caledon	Prize	13·99	24·52	2·756	·570	1·056
White Wine—Hock Type.						
H Cloete, M.L.A., Alphen ..	Prize	11·35	19·89	1·825	·555	·480
Red Wine—Burgundy Type.						
F J Versfeld, Klassenbosch ..	Prize	11·44	20·04	2·197	·532	·720
Red Wine—Claret Type.						
H. Cloete, M L A., Alphen ..	Prize	11·70	20·50	2·128	·536	·594
Dop Brandy.						
James Malan, Constantia ..	1st	53·06	92·98	·113	·075	·402
W. A. Krige, Stellenbosch ..	2nd	53·11	93·08	·045	·100	·660

J. LEWIS, M.A., Analyst.

STELLENBOSCH AGRICULTURAL SOCIETY.

THE 1905 SHOW.

The Stellenbosch Agricultural Society scored a great success at its Annual Show held on the 26th of January. In its general lines the show was similar to that of previous years, but with certain notable improvements. The accommodation for stock was previously very poor and incomplete, but now no complaint on this score can be made, for additional ground has been purchased and roomy stalls and pens have been erected. It is now with pleasure and comparative ease that the visitor can inspect the stock which in place of being closely packed in lines in the avenue is now comfortably housed and sheltered under a good roof. The live stock, although readily accessible to all interested, is quite separate from the remainder of the show, a great consideration in Stellenbosch where so many sightseers come chiefly to see the classes for which the district is famous—the fruit and vegetables and flowers. Of these there was a great display as usual, and everything was of the best quality except peaches which this year are far below the normal both in quantity and quality.

Several points call for comment. Some dissatisfaction was expressed in the Horse section from the grouping of colts and fillies in the same class. The reason given, and it must be admitted it is sound though regrettable, is, that in the past, entries were so meagre that there was no competition and the prizes partook of the nature of gifts, but now on the other hand judges have difficulty in comparing the merits of animals of opposite sexes, and of satisfying themselves, much less the competitors.

The cattle classes were better filled even than usual, Frieslands and cross-bred cows being particularly meritorious. A class for cross-bred bulls is somewhat of an anomaly as it is not in accordance with the best canons to use a cross-bred sire, and the principle was confirmed by the fact since a most promiscous assortment of five bulls possessing indications of a very varied ancestry and no outstanding merits of any were placed before the Judges. Friesland heifers were a very strong class and here again a difficulty arises, as animals of very different ages have to compete together. At Rosebank the age limit is three years regardless of whether a calf has been dropped or not, and while this is certainly an inaccurate and misleading definition of the term "heifer" yet it has the advantage of preventing older animals which are perhaps barren and therefore unprofitable though in good condition from competing with younger cattle possibly in calf. It would be well before any disputes or difficulties arise to have the question properly threshed out and settled.

Pigs, Pigeons and Poultry were all highly satisfactory and the improved accommodation resulted in increased entries all round. Entries of grain, oathay and lucerne forage continue as in previous years to be disappointingly small: little or no interest seems to be paid to these staples. Implements were not in evidence at all, but a stand of dairy appliances sold under the local name "Mariendahl" attracted some favourable attention.

Prize List.

The following are the principal prize winners:—

HORSES.

(Open to the Division of Stellenbosch only).

Best pair carriage horses, Colonial, 3 to 7 years, not under 15 hands: M A Krige, 1 and 2. Best pair cart horses, Colonial, 3 to 7 years, not under 14.2 hands: T J de Waal, 1; J P Fischer, 2. Best pair draught horses, 4 to 7 years, not under 15 hands: Marais Bros, 1; Jas Rattray, 2. Best horse in single harness, 3 to 7 years, not under 14 hands: J Roux, 1; Roux Bros, 2. Best pony in single harness, 3 to 8 years, not exceeding 14.2 hands: P Roux, 1, J J Cruywagen, 2. Best pair Colonial draught mules, 3 to 8 years: Roux Bros, 1; P J Hofmeyer, 2. Best pair Colonial draught mules, not under 14 hands: M A Krige, 1; J A Faure, 2. Best riding horse, 3 to 7 years, not under 14 hands: Roux Bros, 1; C Winn, 2. Best riding pony or galloway, not exceeding 14.2 hands: C M Neethling, 1. Best pair two-year old colts or fillies, suitable for carriage purposes: P Roux, 1. Best pair two-year old colts or fillies, suitable for draught purposes: Jas Rawbone, 1. Best two-year-old colt or filly, suitable for saddle purposes: Jas Rawbone, 1 and 2. Best imported stud stallion, suitable for Colonial purposes: Jas Rawbone, 1; J C Faure, 2. Best imported brood mare, suitable for Colonial purposes: Mrs J Visser, 1; J C Faure, 2. Best Colonial stud stallion: M J de Kock, 1. Best Colonial brood mare: M N Louw, 1; J C Faure, 2.

CATTLE.

(Open to the Division of Stellenbosch only.)

Best bull, Dutch, Colonial: W Gilchrist, 1; J A Faure, 2. Best bull, Alderney or Jersey Colonial: Jas Rattray, 2. Best bull, Ayrshire: Jas Rawbone, 1 and 2. Best bull, Kerry: J P Bridell, 1 and 2. Best bull, red polled: Barry Bros, 1: Prof Morrison, 2 Best bull, any cross breed: J S Pepler, 1; J A Myburgh, 2. Best bull, Dutch, imported: Starke Bros, 1. Best bull, Ayrshire, imported: Jas Rawbone, 1. Best cow, in milk, Dutch, Colonial: Starke Bros, 1; P A Myburgh, 2. Best cow, in milk, Alderney or Jersey, Colonial: J H Classens, 1. Best cow, in milk, Ayrshire, Colonial: Jas Rawbone, 1 and 2. Best cow, in milk, Kerry, Colonial: P A Myburgh, 2. Best cow, red polled, Colonial: P A M Brink, 1. Best cow, in milk. any cross breed: W A Krige, 1; Mrs Dreyer, 2. Best cow, dry, Dutch: Starke Bros, 1; J C Faure, 2 Best cow, dry, Alderney or Jersey: Morkel Bros, 1 and 2. Best cow, dry, Ayrshire: Jas Rawbone, 1 and 2. Best cow, dry, Kerry: J C Faure, 1: P A Myburgh, 2. Best cow, dry, any cross breed: J C Faure, 1, T Micklem, 2. Best two heifers, Dutch: J A Faure, 1; Starke Bros, 2. Best two heifers, Alderney or Jersey: Morkel Bros, 1. Best two heifers, Ayrshire: Jas Rawbone, 1 and 2. Best two heifers, Kerry: J A Faure, 1 and 2. Best two heifers, red polled: Barry Bros, 1. Best two heifers. any cross breed: Starke Bros, 1; P A M Brink, 2. Best two slaughter oxen (veld oxen): Jas Rattray, 1; M J de Kock, 2. Best stall-fed ox: J P Bosman, 1 and 2.

SHEEP AND GOATS.

(Open to the Division of Stellenbosch only.)

Best Angora ram: J C Faure, 1; P A Myburgh, 2. Best three ewes: J C Faure, 1; P A Myburgh, 2. Best Merino ram: Starke Bros, 1 and 2. Best three Merino ewes: Beyers & Co, 1; Starke Bros, 2. Best Persian ram (black head): Mr A Krige, 1 and 2. Best Cape goat ram: D F Ackerman, 1; Beyers & Co, 2. Best three Cape goat ewes: M A Krige, 1; M Myburgh, 2 Best ram of any recognised long-woolled variety of sheep, suitable for slaughter: T J de Waal, 1; H J Joubert, 2. Best three ewes of any recognised long-woolled variety of sheep, suitable for slaughter; Starke Bros, 1 and 2. Best five Merino wethers: Starke Bros, 1 and 2. Best five Cape wethers: M A Krige, 1 and 2. Best five cross-bred wethers: Starke Bros, 1 and 2. Best five Cape goat kapaters: Starke Bros, 1 and 2. Best pet sheep (hans-schaap): J P Bosman, 1. Best five Merino lambs: J Rosseau, 1; Starke Bros, 2. Best five cross-bred lambs (sheep): Starke Bros, 1; J D P du Plessis, 2. Best five kids: J C Faure, 1; N Myburgh, 2.

PIGS.

(Open to the whole Colony.)

Best any breed: C Joubert, 1; F. Rosseau, 2. Best Berkshire: W Gilchrist, 1 and 2. Best any cross breed: C M Neethling, jun, 1; J H de Wet, 2. Best Barrow pig: J H de Wet, 1. Best litter of sucking pigs, not less than six: Beyers & Co, 1.

POULTRY.

(Open to the whole Colony.)

Best Minorca: Mrs Frisby, 2. Best Buff Orpington: Mrs Frisby, 1. Best Black Orpington cock, Colonial: D P du Plessis, 1. Best Plymouth Rock hen, Colonial: D P du Plessis, 1. Best Minorca hen, Colonial: Miss Haussman. Best Buff Orpington hen, Colonial: H Heese, 1. Best Partridge Wyandotte hen, Colonial: W N Pearson, 2. Best Silver Wyandotte hen, Colonial: G Nicholson, 1. Best any cross breed: J P Roux. J.son. Best Plymouth Rock cock, imported: P T Martin, 1. Best Minorca cock, imported: P T Martin, 1. Best Buff Orpington cock, imported: A C Buller, 1. Best Plymouth hen, imported: P T Martin, 1. Best Minorca hen, imported: P T Martin, 1. Best pair guinea fowls (cock and hen): H L Krige, 1. Best turkey cock, Colonial: Mrs J D Krige, 1. Best turkey cock, imported: A C Buller, 1. Best turkey hen, Colonial: A C Buller, 1. Best gander, Colonial: E Lange, 1. Best goose, Colonial: E Lange, 1. Best gander, imported: H Heese, 2. Best Pekin ducks (drake and duck): H Heese, 2. Best Rouen ducks (drake and duck): H Heese, 2 Best Muscovy ducks (drake and duck): Mrs J D Krige, 1. Best any other variety ducks: J P Bridell. Mr A C Buller's special prize (silver cup worth £5; best exhibit Buff Orpingtons, male or female, Colonial; *bona fide* property of exhibitor; cup to be won thrice consecutively before it becomes property; open to the whole colony): Mrs Frisby.

BUTTER, HAM, PRESERVES, PICKLES, ETC.

(Open to the whole Colony.)

Best 5 lb fresh butter: Morkel Bros, 1. Best 5 lb fresh butter, made up in brick-shape pats in muslin: Mrs Myburgh. Best 25 lb salted butter; Mrs Myburgh. Best Colonial ham: Mrs Myburgh, 1. Best loaf home-made bread: Mrs J G van Niekerk, 1. Best 24 mostbollen: Mrs A S Hauptfleisch, 1. Best 3 bottles "Boschjes Stroop": Mrs S Beyers, 1. Best 3 bottles "Most-stroop": Mrs C F Beyers, 1. Best 3 bottles of mulberry syrup: H J Joubert, 1. Best collection chutneys and sauces: Mrs D Beyers, 1. Best assortment of not less than 12 jars pickle: Mrs L Rousseau, 1. Best assortment of not less than 12 jars fruit jellies: Mrs H Dreyer, 1. Best assortment of not less than 12 jars of jam (marmalade): Miss S Beyers 1. Best assortment of not less than 12 jars of canned fruit, with sugar: Miss S Beyers, 1. Best assortment of not less than 12 jars of canned fruit, without sugar: Mrs D Beyers, 1. Best assortment of not less than 12 jars of preserved fruit, confyt: Miss S Beyers, 1. Best exhibit of candied or crystallized fruit: Mrs Frisby, 1. Best 12 bottles liqueur, not less than 3 varieties: Mrs Beyers, 1. Best collection dried fruit, not less than 6 varieties of at at least 5 lb each: Miss S Beyers. Best fancy cake not less than 5 lb in

VEGETABLES.

(Open to the whole Colony.)

Best and largest collection of marketable vegetables, with certificate of own growth : J H de Wet, 1 Best and largest collection of marketable vegetables, without certificate : J H de Wet, 1 Best and largest collection of vegetables suitable for pickling (Attjar), with certificate of own growth : J H de Wet, 1. Best collection of tomatoes : S A le Roux, 1. Best and largest collection of pumpkins : J H de Wet, 1. Best 2 bushels of potatoes : Barry Bros, 1. Best 3 bushels of dry onions : P J Bridell, 1. Best 3 cabbages, any variety : J H de Wet, 1. Best 3 cabbages, spitskool : J Hahn, 1. Best 3 pumpkins, early . D P Roux, 1. Best 3 pumpkins, sweet : Barry Bros, 1. Best 3 calabashes : J P Bridell, 1. Best 6 cucumbers, long : J H de Wet, 1. Best 6 cucumbers, short : J P Bridell, 1. Best 6 beetroots, flat : C G Marais, 1. Best 6 beetroots, long : Barry Bros, 1 Best 12 carrats, yellow, short : J H de Wet, 1. Best 12 scorzonera : J H de Wet, 1. Best 12 parsnips : C M Neethling, jun., 1. Best 12 turnips : J H de Wet, 1. Best 12 leeks : J H de Wet, 1. Best 12 breakfast radish : J H de Wet, 1. Best 12 garlicks : J H de Wet, 1. Best bunch horseradish ; J H de Wet, 1. Best dish of potatoes : A N Bredell, 1. Best dish of tomatoes : Mrs Hausman, 1. Best dish of tomatoes fit for export : C M Neethling, 1. Best dish of peas in pods : J M Heylegers, 1. Best dish of beans in pods : J M Heylegers, 1. Best dish of onions : Barry Bros, 1. Best dish of vegetable marrows, assorted : J F du Toit, 1. Best bunch asparagus : J M Heylegers, 1. Best 6 lettuces : J H de Wet, 1. Best 6 heads green mealies : C G Marais, 1.

FRUIT.

(Open to the whole Colony.)

COLLECTIONS.—Best and largest collection fruit in baskets, fit for sale : C G Marais, 1 ; C M Neethling, jun, 2. Best and largest marketable fruit, with certificate of own growth (in dishes) : C G Marais, 1. Best 24 dishes ripe dessert fruit (different varieties) : J van der Byl, 1. Best and largest collection peaches (nectarines included) : J van der Byl, 1. Best six dishes ripe dessert peaches (different varieties) : J van der Byl, 1. Best and largest collection plums (Japanese included) : C G Marais, 2. Best and largest collection grapes (any variety) : J D Krige, sen, 1. Best and largest collection apples : C G Marais, 1. Best and largest collection pears ; A Nicholson, 1 ; Barry Bros, 2. Best and largest collection citrous fruit : C M Neethling, jun, 2.

PEACHES.—Best dish of not more than eighteen Cape free stone peaches : J van der Byl, 1 and 2. Best dish of not more than eighteen Cape cling stone peaches : J de Waal. 1 and 2. Best dish of not more than eighteen free stone pavies : J van der Bijl, 1. Best dish of not more than eighteen cling stone peaches : C J Marais, 1 ; J H Neethling, 2. Best dish of not more than eighteen free stone yellow peaches : D P Mostert, 1 and 2. Best dish of not more than eighteen nectarines, free stone (any variety) : C G Marais, 1. Best dish of not more than eighteen nectarines, cling stone (any variety) : C J Joubert 1.

PLUMS.—Best dish of eighteen red damson plums : C G Marais, 1. Best dish of eighteen white damson plums : J van der Byl, 1. Best dish of eighteen greengage plums : C G Marais, 1. Best dish of Hahn's German : H J Joubert, 1. Best dish of eighteen Standards of Britain : C G Marais, 1. Best dish of eighteen Kelsey plums : H O Arton, 1. Best dish of eighteen Burbank plums : C G Marais, 1. Best dish of eighteen Wickson plums : H O Arton, 1. Best dish of eighteen Satsuma plums : J H Postlethwaite, 1. Best dish of eighteen Shiro Simomo plums : C G Marais, 1. Best dish of eighteen any other named variety : H O Arton, 1.

APPLES.—Best dish of twelve Red New Year : T J de Waal, 2. Best dish twelve Striped : J H Neethling, 1. Best dish twelve Reinette du Canada : C G Marais, 1. Best dish twelve Reinette du Francaise : C G Marais, 1. Best dish twelve Alexander : C G Marais, 1. Best dish twelve dessert, any other named variety : J Hahn, 1. Best dish twelve stewing apples, of any named variety : Beyers & Co, 1.

PEARS.—Best dish twelve William's Bon Chretien : Barry Bros, 1. Best dish twelve Clapp's Favourite : J H Postlethwaite, 1. Best dish twelve Doyenne de Comice : C G Marais, 1. Best dish twelve Louise Bonne : Barry Bros, 1. Best dish twelve Bergamotte Cassane : C G Marais, 1. Best dish twelve Souvenir d' Congress : A Nicholson, 1. Best dish twelve Duchesse d'Angouleme : J H Postlethwaite, 1. Best dish twelve Beurre Diel : H O Arton, 1. Best dish twelve stewing pears : C G Marais, 1.

FIGS.—Best dish English white: D F Bosman, 1. Best dish Smyrna: J J Heynike, 1. Best dish Grosse Verte: J van der Byl, 1.

CITRUS FRUIT.—Best dish twelve naartjes: P A Myburgh, 1. Best dish twelve Cape lemons: C G Marais, 1. Best dish twelve commercial lemons: A Nicholson, 1. Best dish twelve citrons: C M Neethling, jun, 1. Best dish twelve bitter oranges: J Heynike, 1. Best dish twelve Cape limes (small): A C van der Byl, 1.

GRAPES.—Best dish ripe red Muscadel: C G Marais, 1. Best dish ripe white Muscadel: C G Marais, 1. Best dish ripe Pontac: T J de Waal, 1. Best dish ripe Hermitage: Louw Bros, 1 Best dish ripe Crystal: J P de Waal, 1. Best dish ripe French: C G Marais, 1. Best dish ripe red Greengrape: C G Marais, 1. Best dish ripe white Royal Madeline: C G Marais, 1. Best dish ripe red Royal Madeline: C G Marais, 1. Best dish ripe Stein: C M Neethling, 1. Best dish ripe Chasselas: C G Marais, 1. Best dish ripe Raisin Blanc: C M Neethling, 1. Best dish ripe, any other named varieties: Louw Bros, 1.

MISCELLANEOUS.—Best dish of twelve quinces: H O Arton, 1. Best dish strawberries: J G Stadler, 1. Best dish mulberries,: Miss M Groenewald, 1. Best dish Cape gooseberries: Miss Haussman, 1. Best collection musk melons (two of each): P J Bridell, 1. Best collection water melons (two of each): P de Waal, 1. Best two water melons, groenschil: M L Neethling, 1. Best two water melons, any other variety: P de Waal, 1. Best and largest bunch plantains (Cape bananas): Mrs P Broers, 1

FRESH FRUIT PACKED FOR EXPORT.—Best packed box grapes: M Lock, 1. Best packed box peaches: F Rousseau, 1. Best packed box pears: J P Roux, sen, 1. Best packed box plums: M Lock, 1. Best packed box apples: M Lock, 1. Best packed box tomatoes: M Lock, 1.

AGRICULTURAL PRODUCE.

(Open to the Division of Stellenbosch only.)

Best bag of Rietti wheat, representing 20 bushels: H Theunissen, 1. Best bag of any named variety of wheat: H Theunissen, 1. Best bag of oats, representing 20 bushels: Morkel Bros, 1. Best bag of barley, representing 20 bushels: H Theunissen, 1. Best bag of rye, representing 20 bushels: H J Joubert, 1. Best bag of mealies: R A Morkel, 1. Best bale of pressed oathay: Morkel Bros, 1. Best exhibit of oatsheaves not less than 60 bundles: J F Gornos, 1. Best bale lucerne: R A Morkel, 1.

ROBERTSON AND MONTAGU AGRICULTURAL SOCIETY.

The 1905 Show.

The Robertson and Montagu Agricultural Society put forward an excellent effort this year, and its show, held on the 9th ult., was a pronounced success. Many little things militate against a first-class all-round show this season, notably the variation in the Western weather, which has thrown the fruit back so badly. But though the districts served by this Society are principally viticultural and arable, the stock section of the show is always good, and the horses its strongest feature. It is no exaggeration to say that no district show in the country makes such a grand display of horses as Robertson, in fact this section invariably compares very favourably with the leading shows of the colony.

The 1905 show was no exceptien to the rule, and though the exhibit of horses was not beyond criticism, it was so full of merit as to call for nothing but praise when taken all round. The most attractive feature was the grand display of breeding stock, particularly the mares and some of the younger animals. Robertson is an excellent horse district, and with the stock at present held, a careful selection of sires should result in a most profitable industry.

The cattle were not so well represented this year, except in the Dutch classes Trek and slaughter cattle drew some good exhibits. Agricultural produce is always a full section at this show, and usually combines excellent quality with representative quantity. This year this section was above the ordinary, and some of the competing samples were very good indeed. Vegetables were also a good lot, while fruit was not as good as usual.

PRIZE LIST.

The following is a list of the principal prize winners :—

HORSES, MULES AND DONKEYS —Best imported thoroughbred stallion: J S de Wet, 1 Best imported Cleveland stallion: J S du Toit, 1. Best imported hackney stallion: J S de Wet, 1: W D Malherbe, 2. Best imported Flemish stallion: P J H du Toit, 1; W J van der Vyver, 2. Best Colonial thoroughbred stallion: J P Marais, 1 and 2. Best Colonial hackney stallion: G L M van Zyl, 1; B B Burger, 2. Best Colonial heavy stallion: J A le Roux, 1; J du Toit, 2. Best Colonial other than above specified stallion: Barry Bros, 1; F C Fouche, 2. Best imported Cleveland mare: W J van der Vyver, 1. Best imported hackney mare: P J de Wet, 1; W J Wessels, 2. Best imported (for light work) mare: P J de Wet, 1; H Dawson, 2. Best imported (for heavy work) mare: J J Malherbe, 1; J A Conradie, 2. Best imported mare, with foal: G J Meynhardt, 1; P J de Wet, 2. Best Colonial thoroughbred mare: P Jordaan, 1; D J de Wet, 2. Best Colonial Cleveland mare: J P van der Vyver, 1.

Best Colonial hackney mare: W D Malherbe, 1; D J de Wet, 2. Best Colonial (for light work) mare: W D Malherbe, 1, J W Bruwer, 2. Best Colonial (for heavy work) mare: J S Brewer, 1; P J de Wet, 2. Best Colonial mare with foal: J S Klopper, 1; W J de Wet, 2. Best Colonial other than above specified mare: Burger Bros 1; W D Malherbe, 2. Best imported or Colonial Arabian stallion: G J Meynhardt, 1. Best imported or Colonial Arabian mare: J S de Wet, 1; J B Viljoen, 2. Best Colonial hackney stallion colt, one year: G van Zyl, 1; F D du Toit, 2. Best Colonial hackney stallion colt, two years: P J de Wet, 1; G L M van Zyl, 2. Best Colonial Cleveland stallion colt, one year; Burger Bros, 1. Best Colonial Cleveland stallion colt two years: J du Toit, 1; D J Erasmus, 2. Best Colonial stallion colt, from two to three years, for racing: A Burger, 1; Bruwer Bros, 2. Best Colonial colt or filly, under two years, for racing: J S de Wet, 1; J B Viljoen, 2. Best Colonial matched pair of colts, from one to two years: P J Joubert, 1; J A Conradie, 2 Best Colonial filly, hackney, one year: W D Malherbe, 1; Cilliers Bros, 2. Best Colonial filly, hackney, two years: W D Malherbe, 1; P de Wet, 2 Best Colonial filly, Cleveland, one year J T Rabie, 1 and 2. Best Colonial filly, Cleveland, two years: Bruwer Bros, 1; J T Rabie, 2. Best Colonial filly, one to two years, for racing: Burger Bros, 1; W Rattray, 2. Best Colonial matched pair of fillies, one to two years: J J Burger, 1. Best saddle horse, mare or gelding, not less than 14.2 hands high, exhibited under saddle: A J Marais, 1; Cillier Bros, 1. Best saddle horse, mare or gelding, below 14.2 hands high, exhibited under saddle: L Klopper, 1; W P Roux, 2. Best buggy-horse, mare or gelding exhibited in buggy: G J Malherbe, 1; P G Erasmus, 2 Best pair carriage-horses, exhibited in carriage: G Malherbe, 1. Best pair cart-horses, exhibited in cart: D le Roux, 1; W J de Wet, 2. Best pair trained horses, for heavy work: Liberman & Buirski. 1: G J Burger, 2. Best five mares for breeding purposes, not less than three years old: J F Burger, 1; F D du Toit, 2. Best pony stallion, not over 13 hands: Liberman & Buirski, 1. Best pony mare, with foal, not over 13 hands; J R Rabie, 1: W J Wessels, 2. Best pony mare, not over 13 hands: C J Burger, 1 and 2. Best team of eight mules, exhibited in harness: J A Marais, 1; J T Rabie, 2. Best pair cart mules: P J Hugo, 1; C P Klopper, 2. Best imported jackass, for breeding purposes: J F Joubert, 1; P J de Wet, 2. Best Colonial jackass for breeding purposes: D B Colyn, 1; G Kriel, 2. Best Colonial donkey mare: W D Malherbe, 1; P J de Wet, 2. Best Colonial jackass, under two years: P Malherbe, 1; P J de Wet, 2. Best Colonial donkey mare, under two years: P J de Wet, 1; R du Toit, 2

CHAMPION CLASS.—Champion imported stallion: J S de Wet, imported hackney, 1. Champion Colonial stallion: G L M van Zyl, Colonial stallion. Shetland pony: P J de Wet, special. Flemish mare, imported: G J Meynhardt, special.

CATTLE.—Best imported shorthorn bull: Paul de Wet, 1. Best imported Dutch or Friesland bull: A J Malan, Wellington, 1 and 2 Best Colonial Ayrshire bull: J P Marais, 1. Best Colonial Jersey or Alderney bull: C J Burger, 1; J J Burger, 2. Best Colonial Afrikander bull: G A F Bruwer, 1: B W van Dyk, 2. Best Colonial Kerry Bull: G F Malherbe. 1. Best Colonial bull, any other breed, twelve months and over: B J Viljoen, 1. Best imported cow, any other breed: H Smal, 1. Best Colonial Dutch, or Friesland cow: P J Fourie, 1: P J H du Toit, 2. Best Colonial shorthorn cow: D J de Wet, 1. Best Colonial Jersey or Alderney cow; G J Marais, 1; J C Gie, 2. Best Colonial Kerry cow; A F Marais, 2. Best Colonial Afrikander cow: J F Wessels, 1 and 2. Best Colonial Dutch or Friesland heifer, over one year: Adv. Van Zyl, 1 and 2. Best Colonial Jersey or Alderney heifer, over one year: L H de Kock, 1. Best Colonial Afrikander heifer, over one year: J T Rabie, 1 and 2. Best Colonial heifer, any other breed: J P van der Vyver, 1; P J H du Toit, 2. Best Colonial three heifers, for dairy purposes: J F Malherbe, 1; J S Bruwer, 2. Best stall-fed ox: Neethling & Buirski, 1 and 2. Best three field slaughter oxen: Neethling & Buirski, 1 and 2. Best team of eight oxen in yoke (Afrikanders): D J de Wet, 1. Best team of eight oxen in yoke (not Afrikanders): W D Malherbe, 1; D J de Wet, 2. Best eight young oxen (Afrikanders): J T Rabie, 1. Best eight young oxen (not Afrikanders): J T Rabie, 2. Best cow in milk, to be milked before the show to the satisfaction of the committee: J J Burger, 1; Bruwer Bros, 2. Best cow, not in milk: G D During, 1; Bruwer Bros, 2.

CHAMPION CLASS.—Champion imported mare: A J Malan, Wellington. Champion Colonial bull: J P Marais, Wellington. Slaughter cow: Special, J T Rabie.

SHEEP.—Best Persian ram: Barry Bros, 1 and special; Wynand Rabie, 2. Best five Persian ewes: P J de Wet, 1; J F Burger, 2. Best five Afrikander wethers: J F Wessels, 2. Best five fattened sheep: J F Burger, 1; J A Neethling, 2. Best fattened sheep: A A Cilliers, 1; J S Cilliers, 2. Best five Persian lambs, not over six months: Barry Bros, 1; W J Wessels, 2.

Goats.—Best Afrikander goat ram, not less than two years: B W van Dyk, 1; G F Malherbe, 2. Best five Afrikander goat wethers, for slaughter: J C van Graan, 1; J H Conradie, 2 Best five Afrikander goat ewes: B W van Dyk, 1; W Rabie, 2. Best five goat lambs of 1904 lambing season: B W van Dyk, 1; J C Rabie, 2.

Pigs.—Best boar, not under one year: G J Marais, 1; G Kriel, 2. Best sow, not under one year: A P Marais, 1; G Kriel, 2. Best barrow pig, not under two years: J H Conradie, 1; G J Marais, 2. Best three young pigs, not over six months: J P Marais, 1; G A F Bruwer, 2. Best boar and sow for breeding purposes, not over one year; P J de Wet, 1.

Best Colonial Wines, Brandy, Etc. (Open only to Wholesale Dealers and Professionals).—Best six bottles sweet Muscadel wine, produce 1896-1902: Barry Bros, Montagu, 1. Best six bottles sweet Muscadel wine, vintage 1903: Barry Bros, Montagu, 1. Best six bottles dry Muscadel wine, vintage 1903: Barry Bros, Montagu, 1. Best six bottles Jeropico wine (white): Barry Bros, Montagu, 1. Best six bottles Jeropico wine (red): Barry Bros, Montagu 1 Best six bottles brandy (old Dop): Barry Bros, Robertson, 1. Best six bottles brandy (Dop), 1903: Barry Bros, Robertson, 1. Best six bottles Colonial brandy (other than dop): Barry Bros, Robertson, 1. Best six bottles Colonial spirits, 60 per cent. over proof Sykes): Barry Bros, Robertson, 1. Best six bottles vinegar: Barry Bros, Montagu, 1.

Colonial Wine and Brandy. (Open only to farmers) Best six bottles white wine, produce 1896-1902: T and D Hugo, 1. Best six bottles white green grape wine, produce 1903 vintage: T and D Hugo, 1. Best six bottles sweet Pontac wine, vintage 1903: W J Wessels, 1. Best six bottles sweet Muscadel wine, produce 1896-1902: J C van Graan, 1. Best six bottles Jeropico wine (white): T and D Hugo, 1. Best six bottles Jeropico wine (red: T and D Hugo and G van Eden, 1. Best six bottles brandy (old dop): O Stevens, 1. Best six bottles brandy (dop), 1903: T and D Hugo, 1. Best six Colonial vinegar: P le Roux, 1. Brandy, 1904: D le Roux, 1.

Cereals and Produce.—Best 50 lb. (white bags) Klein wheat: P J Viljoen, 1. Best 50 lb. (white bags): Rietti wheat: E J Marais, 1. Best 50 lb (white bags) Median wheat: J C Fouche, 1. Best 50 lb (white bags) barley, for malting purposes: J T Rabie, 1. Best 50 lb (white bags) ordinary (Colonial) barley: J T Rabie, 1. Best 50 lb (white bags) oats: E J Marais, 1. Best 50 lb (white bags) rye: P J Viljoen, 1. Best 50 lb (white bags) white mealies: J A Marais, 1. Best 50 lb (white bags) yellow mealies: P W Marais, 1. Best 50 lb (white bags) Weerschyn beans: Bruwer Bros, 1. Best 50 lb (white bags) sugar beans: P J Viljoen, 1. Best 50 lb (white bags) stam beans: W J de Wet, 1. Best 50 lb (white bags) Zwartbek beans: T J Rabie, 1. Best 50 lb (white bags) peas: J F van Graan, 1. Best 50 lb (white bags) lentils, coarse: J T Rabie, 1. Best 50 lb (white bags) lentils, fine: D J le Roux, 1. Best 50 oatsheaves: Lieberman & Buirski, 1. Best 2 lb onion seed: P J Viljoen, 1. Best pressed bale lucerne, not less than 100 lb: Neethling and Buirski, 1. Best pressed bale oathay, not less than 100 lb: Neethling and Buirski, 1.

Fruit.—Best dish red Muscadel grapes: G J Marais, 1. Best dish white Muscadel grapes: Bruwer Bros, 2. Best dish red Hanepoot grapes: G J Marais, 1. Best white Hanepoot grapes: G J Marais, 1. Best dish Hermitage grapes: J F Burger, 1. Best dish Barbarossa grapes: G D During, 1. Best dish any other sort: E J Marais, 1. Best collection grapes, six bunches of each sort: A F Bruwer, 1. Best dish 20 peaches, loose stone: Bruwer Bros, 1. Best dish 20 peaches, cling stone: J T Bruwer, 1. Best collection peaches, six of each sort: Bruwer Bros, 1. Best 20 apples, golden pippin, J W Bruwer, 1. Best 20 apples, Koo Zuur: J W Bruwer, 1. Best 20 apples, any other sort: C P Klopper, 1. Best collection apples, six of each sort: J W Bruwer, 1. Best 20 apples, Bergamotte: Bruwer Bros, 1. Best 20 pears, Saffron: W Kirstein, 1. Best 20 pears, Williams Bon Chretien: B B Burger, 1. Best 20 pears, any other sort: W J de Wet, 1. Best collection of pears, six each sort: B B Burger, 1. Best 20 nectarines (loose stone): S W Cloete, 1. Best 20 nectarines (cling stone): W J de Wet, 1. Best bunch of bananas: Bruwer Bros, 1. Best three watermelons, any other sort: F J Marais, 1. Best 20 plums, Kelseys: G A F Marais, 1. Best 20 plums, Satsumas: W J de Wet, 1. Best 20 plums, Damask: W J de Wet, 1. Best 20 plums, any other sort: J J Preiss, 1. Best collection of plums: J W Bruwer, 1. Best dish figs: G Conradie, 1.

Fruit Packed for Export: Best box of grapes, packed for export, containing 15 lb fruit: V Naidoo, 1. Best box of peaches, packed for export, containing 15 lb fruit: V Naidoo, 1. Best box pears, packed for export, containing 15 lb fruit: V Naidoo, 1. Special prizes for the best packed five boxes of fruit for export (different sorts): V Naidoo, 1.

DRIED FRUITS: Best 25 lb loose raisins: P W Marais, 1. Best 25 lb stalk raisins: G J Marais, 1. Best 10 lb meebos: G A F Bruwer, 1. Best 25 lb currants: W J Wessels, 1. Best 25 lb sultana raisins: P W Marais, 1. Best bushel of almonds: D J de Roux, 1. Best 25 lb prunes, any sort: J W Bruwer, 1. Best collection of dried fruits, not less than 3 lb of each sort: G J Marais, 1

OSTRICH FEATHERS.—(The produce of the exhibitor): Best ¼ lb ostrich feathers (whites): T and D Hugo, 1 and 2. Best ¼ lb ostrich feathers (feminas): T and D Hugo, 1. Best ¼ lb ostrich feathers (blacks): T and D Hugo, 1. Best ¼ lb ostrich feathers (tails): T and D Hugo, 1 and 2. Best ¼ lb ostrich feathers (drabs): T and D Hugo, 1. Best variety, not less than 2 lb in all, and to be not less than ten distinct kinds of not less than 3 oz each, including as under: Whites, medium, drab medium blacks, mottled, long drabs, long blacks, femina, white tails, BB tails, femina tails: T and D Hugo, 1.

VEGETABLES.—(The produce of the exhibitor): Best basket Early Rose potatoes. E C H de Wet, 1 Best up-to-date: F J Marais, 1. Best any other sort potatoes: E C H de Wet, 1. Best basket sweet potatoes: F J Marais, 1. Best basket yellow onions: P J Viljoen, 1. Best basket white onions: P J Viljoen, 1. Best two early pumpkins: P W Marais, 1. Best two ordinary pumpkins: G A F Bruwer, 1. Best six round red beetroot: G J Marais, 1. Best three cabbages: J W Minnaar, 1. Best six yellow carrots (short horn): J J Malherbe, 1. Best six yellow carrots (long horn): J J Malherbe, 1. Best dish tomatoes (round): J J Burger, 1. Best dish tomatoes (flat): J J Malherbe, 1. Best three vegetable marrows (custard): B W van Dyk, 1 Best three vegetable marrows (long): E C H de Wet, 1. Best six cucumbers: J J Malherbe, 1. Best dish green beans: P W Marais, 1. Best six stalks rhubarb: D B Colijn, 1. Best and largest collection of vegetables: P W Marais, 1. Green mealies: E C H de Wet, 1.

SLUITS—THEIR EVIL AND PREVENTION.

By G. E. Dugmore.

In the Indwe and Lady Frere parts of the country sluit formation is making rapid progress. It is a purely grass country, very hilly and undulating, with deep alluvial soil in the valleys—in some of which sluits 30 feet deep have been formed within the memory of persons still living, where formerly heavily grassed vleys existed.

The process of sluiting is still in what may be called its initial stage, but is progressing yearly with greater rapidity, and has by no means reached its limit.

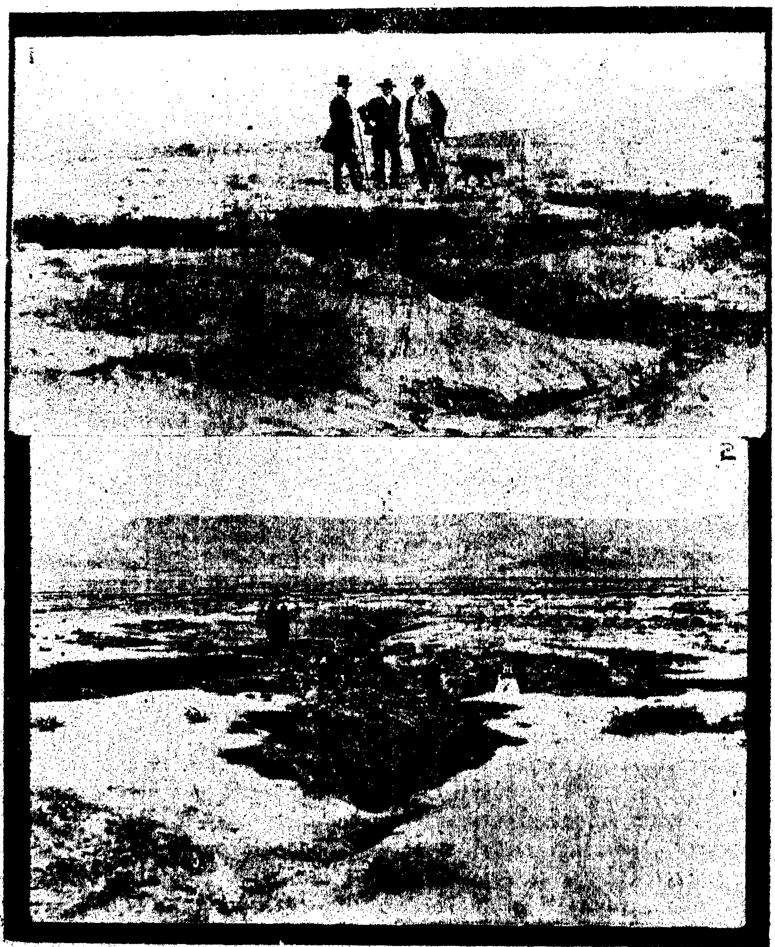
There are no indigenous forests—the country is specially a grazing country for sheep and cattle and is heavily stocked. The six months in the year, May to October, are dry and cold, with severe frosts; the rainfall in summer, especially January to March, comes in heavy thunderstorms, causing great rushes of stormwater; the grass grows long, and in winter becomes very dry, and is almost universally burnt in spring, in order to get short green grass, as sheep do not thrive on long dry grass—and the lambing season being October, green grass is wanted to give the ewes milk.

There are then brought about conditions specially favourable for sluit formation, the soil is trodden by stock, the grass is fed or burnt off; and the heavy summer storms cause a rush of water, which flows unchecked and speedily causes sluits to form. Once the grass-protected surface is cut through, the subsoil is of a crumbling nature, and the sluit increases in depth and width with great rapidity, the rush of water undermining the banks. During the dry winter large cracks open along the sluit sides, and thousands of tons of soil fall in, and are carried away during the storms of the next summer.

In this part, owing to the depth of the alluvial soil, in a short time the sluits attain a depth of 30 feet. At the head of the sluit there is a perpendicular drop from the level of the grass-covered surface—sometimes the full depth of 30 feet, and the channel cutting effect of a body of stormwater falling this height can be easily imagined. This proceeds, eating the soil away, until checked by a ledge of rock being reached. All the evil effects enumerated in the Government Circular naturally follow, and are abundantly in evidence here.

Measures for Prevention.

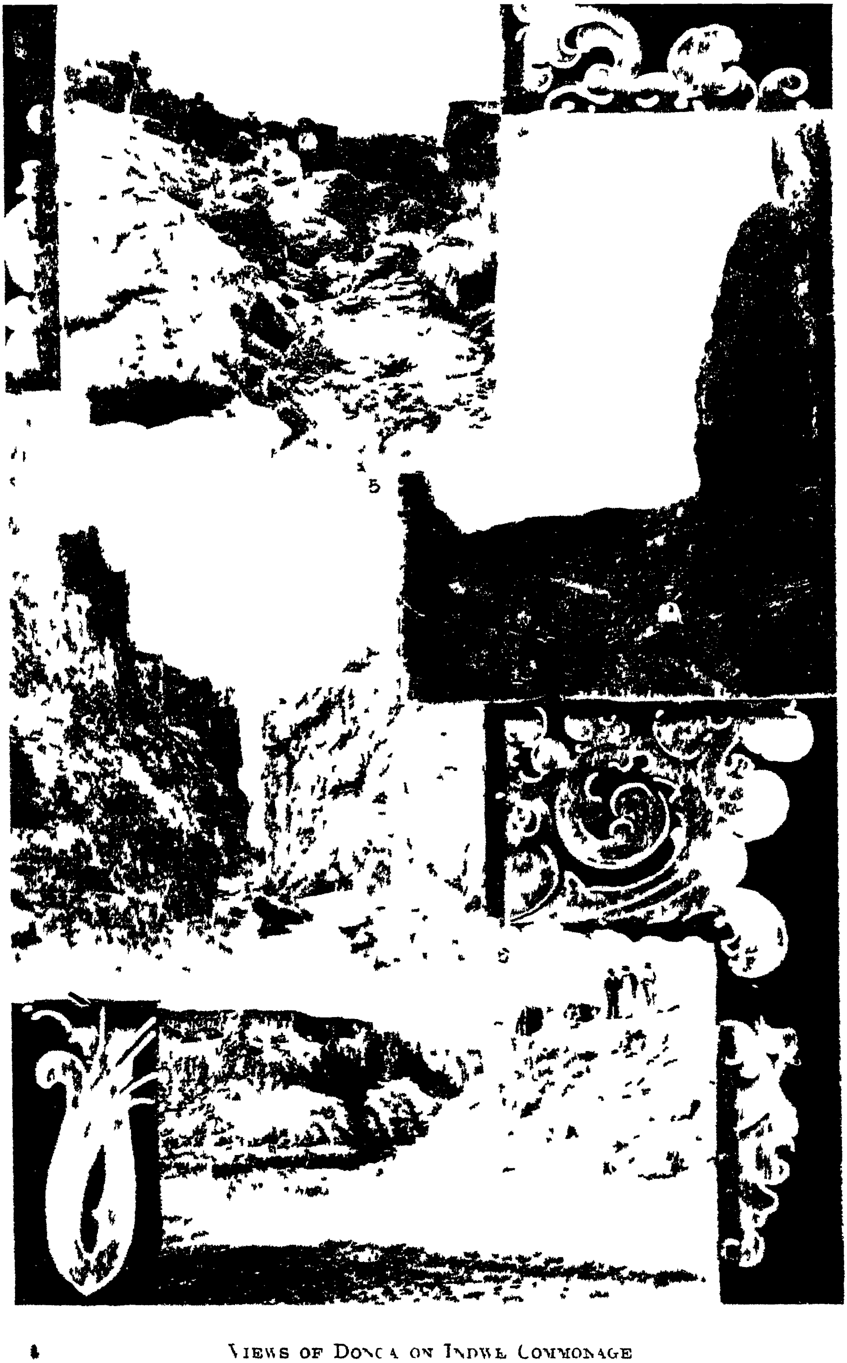
It is obvious that water will find its way to the lowest point, and where large sluits are already formed in valleys, it may be impossible to divert it into other channels. In such cases I think low dams of stone, bush, etc., aided by wire netting—in fact, anything that will stop the sluit—should be made at intervals, and in the soil arrested by these barriers, trees, such as the common and basket willow, poplars, white acacias—both of which throw up



Views of Donga on Indwe Commonage.

(*From Photos. by Mr John Colley.*)

1. This view shews the level surface of ground being cut through by the water at the upper end of the Donga. 2. The same Donga at a point lower down, illustrating the ramifications of the Sluit, and the banks falling in.



VIEWS OF DONGA ON INDWE COMMONAGE

(*From Photos by Mr John Colley*)

3 View at a different point, following the Donga down stream, the Donga being 20 feet deep The banks undermined cause masses of earth to fall in and choke the channel 4 In foreground a man, say 6 feet high standing in the channel, looking up to banks 30 feet high, ready to fall 5 A portion where the channel has been swept clear—near the outlet 6 The outlet through which the water reaches the Doorn River

suckers, stools—Pampas grass, or in fact any plant which will grow, and by the action of its roots assist in making the barrier more permanent, and by growth above the surface arrest the silt, should be planted. The bed of the sluit being thus raised, the sides would fall in, and eventually, instead of perpendicular banks, upon which nothing can grow, a sloping bank, at the "angle of repose" would be formed and soon become covered with grass. At the heads of sluits, stone slopes should be built to break the perpendicular drop and prevent the eating away of the surface soil. Where such a sluit, and its branches embrace a fairly large area, the whole should be fenced, and stock entirely excluded, until the trees and plants are thoroughly established and safe from injury—even for several years, if necessary.

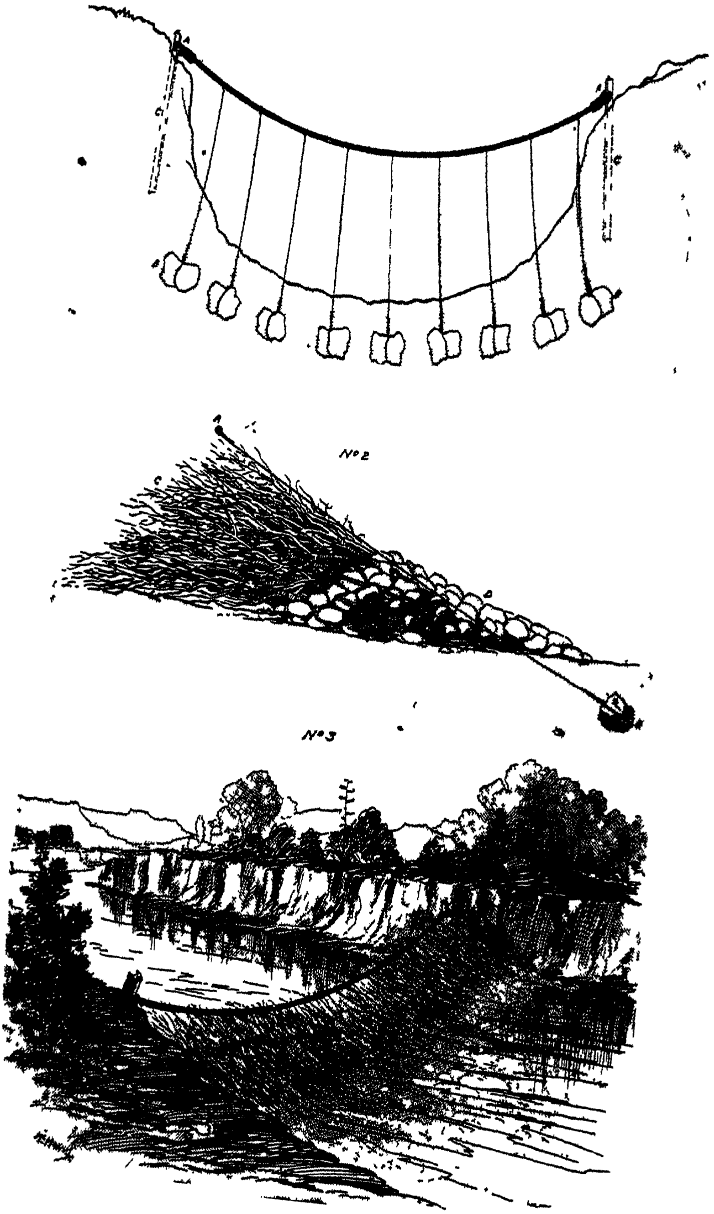
Mr. E. R. Bradfield has suggested Pampas grass, as a plant likely to be a great success, and, having watched its growth in my garden, I am so impressed with its value, that I am having plants raised from seed for the purpose of trying its effects, especially in arresting silt from being carried into dams, by planting barriers of Pampas grass to act as a sieve in the watercourses leading to the dams. I believe a broad belt of this grass planted across the valley above the Beaufort West dam would be of immense service in checking the silting up of this and similar dams. The grass might be reaped every year at suitable time, and, either as ensilage or hay, be used as fodder for cattle or bedding for horses.

Where the contour of the ground allows water to be diverted from a sluit and made to follow on a level plain, a low earth bank, planted with the American Aloe should be effective.

Farmers in this country do not yet seem to appreciate the value of co-operation, and this matter of stopping sluits hardly lends itself generally to co-operative action. Each individual will have to do the best he can on his own land, though no doubt mutual assistance could be afforded by neighbours having bushes, aloe plants, &c., giving to those requiring them. What is required is to bring home to every one the evil and damage being wrought by allowing the process of sluiting to proceed unchecked, and get farmers and landowners to realize that in their own interests they must adopt preventive measures. It can only be done by degrees, and constant watchfulness and attention, extending over years, is necessary. If every landowner does his duty to his own land, there will be no need for State interference or assistance.

Railways undoubtedly cause damage by interrupting the natural flow of water spreading over the veld, and concentrating it at culverts. Whenever this happens, the State should do all that is possible to minimise the mischief.

In most cases no great outlay of capital is necessary, the work should be done by the ordinary staff of farm labourers. Where it is thought desirable to enclose by fencing, the trees planted would eventually reimburse the outlay, and in any case be an asset of considerable value in a treeless country like ours. The common Willow, so easily grown from cuttings, speedily attains a large-sized



Proposed Dam in Doorn River.

No 1 —Elevation.—A. Wire Cable. B Stone Anchors wired to Cable. C. Rail Posts to hold Cable.

No 2 —Section.—A. Wire Cable. B. Stone Anchor sunk in River Bed. C. Bushes and Branches. D. Stones.

No. 3 —Construction.

tree, if protected from stock, and in the early spring the abundant growth of leaves and young twigs is grand feeding for cattle a sufficient quantity of which would save the lives of many poverty stricken animals in a dry spring such as we have experienced the past three years. Poplars and Robinias throw up suckers, and speedily form quite small forests of timber most useful to the farmer.

'The Indwe Company have decided to work on the above lines on their farms. In the Doorn River, which is simply an immense donga, where formerly a broad vley existed, an experiment is to be tried to dam the river, with the object of getting the channel to silt up. Having the material in the shape of disused wire cables and railway rails, it is intended to stretch a cable slackly across the river, the ends being fastened to stakes of railway rails driven deeply into the river banks. Wire stays are to be attached to the cable at short intervals, and anchored to large stones buried in the river bed up stream side of the cable. Thorn trees and bushes will be drawn from stream side under the cable, and fastened by wire to the stays, and stones piled on the stump ends of the trees to keep them in place, the whole forming a barrier to arrest the silt, while letting the water pass until the river bed is raised to the height and contour of the cable. Should the experiment prove successful and the dam stand, it will be repeated until the whole river bed is silted up. The banks are cut through by sluits, some of large size. These are to be dealt with in the ways indicated in former part of this article. The whole area is to be fenced and planted as above described.

If successful, trees will later be planted in the silt and along the banks, to assist consolidation.

WORCESTER AGRICULTURAL SOCIETY.

THE 1905 SHOW.

The Worcester Show this year was, without doubt, the best and most representative ever held in that fertile district. The pleasant little town was crowded with visitors on the day of the show, the 15th ultimo, and everything went very pleasantly. The exhibition was so good all round that it seems a pity the Executive could not have carried out the original intention and run it for two days instead of one. Where there is so much to see, it is more than difficult to get through all the exhibits in one afternoon.

The horses are always an interesting lot at Worcester, and this year proved no exception to the rule. The best feature of this section was the excellent array of mares and foals—all good and promising. The stallions were a good lot, too, but nothing new, or striking one as being any great advance on previous shows, except as to numbers and condition. Hackneys and Flemings (here entered as Dutch) seem to be the favourite sires of these parts. Our old friend Matchless of Etton, was again placed at the head of the hackneys, beating Gay Danegelt, a son of Danegelt, and half brother to Tribute. Gay Danegelt is owned by Messrs. Mountford & Mawle, of Klipheuvel, and more should be heard of him before the show season is over. The heavy classes were poorly supported, which is not surprising, everything considered.

The cattle section was fairly well filled and representative of the district. The strongest class was the Frieslands, the best of these being the Colonial bred cows and heifers. The young stock all through was very promising. Afrikanders were an excellent display, and the slaughter stock was well up to the mark.

The best and strongest sections were those devoted to fruit, where some very fine examples of what the Western Province can produce were exhibited. The other classes were also well filled.

Prize List.

MULES, HORSES, AND DONKEYS.

Best imported thoroughbred (racer) stallion, from 3 years: J S de Wet, 1. Best imported Cleveland stallion, from 3 years: J S du Toit, 1; R P de Wet, 2. Best Colonial Cleveland stallion, from 3 years: J C Rabie, 1. Best imported Hackney or roadster stallion from 3 years: J S de Wet, 1; Mountford and Mawle, 2. Best Colonial Hackney or roadster stallion from 3 years: G M van Zyl, 1; J C Rabie, 2. BestColonial shire stallion, from 3 years: C and P le Roux, 1. Best imported Clydesdale stallion, from 3 years: N Heatlie, 1. Best Colonial Clydesdale stallion, from 3 years: A H du Toit, jun, 1. Best imported Dutch stallion, from 3 years: W J van der Vyver, 1; G J Hamman, 2. Best Colonial stallion not provided for in any of the above classes, from 3 years; D Hamman, 1; P J J Voesee, 2. Best Colonial thoroughbred (racer) mare, from 3 years: A P Burger, 1; J P Hamman, 2. Best imported Cleveland mare, from 3 years: W J van der Vyver, 1; P D de Wet, 2. Best Colonial Cleveland mare, from 3 years: W and A van der Merwe, 1; P C Naude, 2. Best imported Hackney or roadster mare, from 3 years: P J de Wet, 1; G P Hamman, 2. Best Colonial Hackney or roadster mare, from 3 years: S J Rabie, 1; P C Naude, 2 Best imported shire mare, from 3 years: F de Vos, 1; P P Deetlefs, 2. Best Colonial shire mare, from 3 years: P C Naude, 1; J P Hamman, 2. Best imported Clydesdale mare, from 3 years: D Hamman, 1; G F Naude, 2 Best Colonial Clydesdale mare, from 3 years: C Heatlie, 1. Best imported Dutch mare, from 3 years: J H N Steyn, 1 and 2. Best imported mare of any breed not provided for in any of the above classes, from 3 years: D D Hamman, 1; A P Hamman, 2. Best Colonial mare not provided for in any of the above classes, from 3 years: J S de Wet, 1; Burger Bros, 2. Best five brood mares, imported or Colonial, any breed: G F Naude, 1. Best five brood mares, bred by the exhibitor: J S Kloppers, 1; J C Rabie, 2. Best South African bred mare, light, any type: P and J du Toit, 1 and 2. Best South African bred mare, heavy, any type: T and D Hugo, 1 and 2. Best mare with foal, imported or Colonial, any breed: J Ravie, 1; P J de Wet, 2. Best pair of carriage horses (not over 15 hands), to be exhibited in harness in a vehicle: J S du Toit, 1; A J B van der Riet, 2. Best pair of cart horses (not over 15 hands), to be exhibited in harness in a vehicle: C W du Toit, 1; J C Rabie, 2. Best buggy horse, to be exhibited in harness in a vehicle: P J Erasmus, 1; W N Roux, 2. Best pair of draught horses for heavy work, to be exhibited in harness in a vehicle: H J Hugo, 1; C Heatlie, 2. Best pair of ponies 12 hands and under, to be exhibited in harness in a vehicle: G W Hamman, 1. Best saddle horse (stallion, mare, or gelding), to be exhibited under saddle: A J B van Niekerk, 1; G J Marais, 2; W P Roux, 3. Best pony, 14 hands and under, to be exhibited under saddle: C P Kloppers, 1; Neethling and Buirski, 2. Best fancy pony, 50 inches and under, to be exhibited under saddle: G J Hamman, 1; P J de Wet, 2. Best lady's horse, to be ridden by a lady: G W Hamman, 1; A H Viljoen, 2. Best thoroughbred (racer) colt, 2 years old: P Jourdaan, 1. Best Cleveland colt, 2 years old: J C Marais, 1; J A Dreyer, 2. Best Hackney or roadster colt, 2 years old: P W de Wet, 1; C W le Roux, 2. Best Clydesdale colt, 2 years old; A M du Toit, 1. Best Dutch colt, 2 years old: J C Dreyer, 1. Best colt, any breed, not provided for in any of the above classes, 2 years old: J R van der Merwe, 1; J C Dreyer, 2. Best thoroughbred (racer) colt, 1 year old: J S de Wet, 1. Best Cleveland colt, one year old; E D de Wet, 1; J and C Naude, 2. Best Hackney or roadster colt, one year old: J H van Zyl, 1; N W de Wet, 2. Best shire colt, 1 year old: A M du Toit, 1; J S Kloppers, 2. Best Dutch colt, 1 year old; C and P le Roux, 1. Best colt, any breed, not provided for in the above classes, 1 year old: W P Roux, 1; Burger Bros, 2. Best Hackney or roadster filly, 2 years old; M E Rabie, 1; P J de Wet, 2. Best Shire filly, 2 years old: T and D Hugo, 1: J S Naude, 2. Best filly, any breed, not provided for in any of the above classes, 2 years old; E J de Wet, 2. Best thoroughbred (racer) filly, 1 year old: Burger Bros, 1; A P Burger, 2. Best Cleveland filly, 1 year old: G J Hamman, 1; J S du Toit, 2. Best Hackney or Roadster filly, 1 year old: A H Viljoen, 1; C Heatlie, 2. Best shire filly, 1 year old; J S Kloppers, 1; P C Naude, 2. Best Clydesdale filly, 1 year old: A H du Toit, 1. Best filly, any other breed, not provided for in the above classes, 1 year old: J C Rabie, 1. Best and most evenly-matched pair of colts, from 1 to 2 years: A P Hamman, 1. Best span of imported mules, not less than 8, to be exhibited in harness in a wagon: C P Kloppers, 1; A H du Toit, jun., 2. Best span of Colonial mules, not less than 8, to be exhibited in harness in a wagon: J B van Niekerk, 1; J and C Naude, 2. Best pair of imported cart mules: J C S Deetlefs, 1; S C Jacobs, 2. Best pair of Colonial cart mules: C P Naude, 1; A D J du Toit, 2. Best imported jackass for breeding purposes: Burger Bros. 1; J C Rabie, 2. Best Colonial jackass for breeding purposes: P de Wet, 1. Best Colonial jenny for breeding purposes: P J de Wet, 1 and 2.

CATTLE.

Best Colonial Dutch Bull, over 3 years: D de V Rabie, 1; J C Rabie, 2. Best Colonial Alderney bull, over 3 years; G J Naude, 1; H Heese, 2. Best Colonial Jersey bull, over 3 years: A H du Toit, 2. Best Colonial Dutch bull, under 3 years: G J Hamman, 1; T and D Hugo, 2. Best Colonial Jersey bull, under 3 years: L J Burger, 1; C W H Kohler, 2. Best imported Dutch cow, in milk or in calf: P v d Westhuizen, 1 and 2. Best Colonial Dutch cow, in milk or in calf: A M du Toit, 1;

W F Maritz, 2. Best imported shorthorn cow, in milk or in calf: C Heatlie, 1. Best imported Jersey cow, in milk or in calf: W H Moyle, 2. Best Colonial Jersey cow, in milk or in calf. C W H Kohler, 1 and 2. Best Colonial Kerry cow, in milk or in calf: J H Adams, 1. Best cow, any other breed, not provided for in the above classes, in milk or in calf: T and D Hugo, 1; A H Metcalfe, 2. Best Colonial Dutch heifer, under 3 years: T and D Hugo, 1; A M du Toit, 2. Best Colonial Alderney heifer, under 3 years: G P Roos, 1; R W Lotz, 2. Best Colonial Jersey heifer, under 3 years: Donderhoek Fruit Syndicate, 1. Best Colonial Kerry heifer, under 3 years: C Heatlie, 1; H Heese, 2. Best three Dutch heifers, from 1½ to 3 years, bred by the exhibitor: T and D Hugo, 1; J C Rabie 2. Best milch cow, any breed, to be milked the evening previous to the day of the show, in the presence of a person duly thereto appointed, and again to be milked on the day of the show in the showyard: D C Krynauw, 1; C Heatlie, 2.

SHEEP.

Best imported merino ram, combining size and symmetry with fineness and closeness of wool: G J Hamman, 2. Best Colonial merino ram, combining size and symmetry with fineness and closeness of wool: G J Hamman, 1; J de Vos, 2. Best six merino rams, under 1 year, bred by the exhibitor: G J Hamman, 1; M G Uys, 2. Best Persian ram: C P Kloppers, 1, 2, and special. Best six Persian rams, under 1 year, bred by the exhibitor: P J de Wet, 1; C D Kloppers, 2. Best Afrikander ram: A H du Toit, jun. 1; C and O le Roux, 2. Best three imported merino ewes, combining size and symmetry with fineness and closeness of wool: G J Hamman, 1 and 2. Best six Colonial merino eyes, combining size and symmetry with fineness and closeness of wool: G J Hamman, 1: M C Uys, 2 and special. Best six merino ewes, under 1 year, bred by the exhibitor: G J Hamman, 1; M G Uys, 2. Best six Persian ewes: P J de Wet, 1. Best six Persian ewes, under 1 year, bred by the exhibitor A P Burger, 1; C and P Kloppers, 2. Best six Afrikander ewes: W F Maritz, 2. Best six merino wethers, bred by the exhibitor: M G Uys, 1; P D Jordaan, 2. Best six Persian wethers, bred by the exhibitor: A P Kloppers, 1; A P Burgers, 2. Best six Afrikander wethers, bred by the exhibitor: D F Viljoen, 2. Best six lambs, cross-bred, under 1 year, best suited for slaughtering purposes: P D Jordaan, 1; J S Rabie, 2. Best (Hans) sheep: G J Hamman, 1 and 2.

GOATS.

Best Afrikander goat ram: A P Hamman, 1 and 2. Best three Colonial Angora ewes: P D de Wet, 1 and 2. Best six Afrikander goat ewes: J S Naude, 1; J P Hamman, 2. Best six Afrikander goat ewes, under 1 year old, bred by the exhibitor: A P Hamman, 1; A H Viljoen 2. Best six Afrikander goat wethers, bred by the exhibitor: D F Viljoen, 1; A H Viljoen, 2. Best (Hans) goat: A H Viljoen, 1 and 2.

SLAUGHTER STOCK.

Best stall-fed ox: A H Viljoen, 1; Neethling and Buirski, 2. Best three grass fed oxen: Neethling and Buirski, 1 and 2 Best six merino wethers: Dr F Viljoen, 2. Best six Afrikander wethers: P J D Hofberg, 1; W F Maritz, 2. Best six Persian wethers: A P Kloppers, 1; D F Viljoen, 2. Best six wethers, any breed not provided for in above classes: G J Hanau, 1; C P le Roux, 2. Best six Afrikander kapater goats: D F Viljoen, 1; P J D Hofberg, 2.

PIGS.

Best imported Berkshire boar: C W le Roux, 2. Best Colonial boar, any other breed, not provided for in the above classes: C W le Roux, 1; N Heatlie, 2. Best Colonial Yorkshire sow, middle or small (Kolbroek): D W Viljoen, 2 Best barrow pig, for slaughter, any breed: J J Beukes, 1; P J van der Merwe, 2. Best three barrow pigs, under 1 year-old: M P Rabie, 1 and 2.

POULTRY.

Best Cochins, any colour, cock and hen: H Heese, 1. Best Brahmas, any colour, cock and hen: D W Viljoen, 2. Best barred Plymouth Rock cock, cock and hen: W Pearson, 1. Best Spanish, black, cock and hen: J S du Toit, 2. Best Leghorn, white, cock and hen: H Heese, 2. Best Leghorn, any other colour, cock and hen: F G Strangman, 2. Best Indian Game, cock and hen: W Buller, 1. Best Houdan, cock and hen: W Buller, 2. Best Wyandotte, cock and hen: H Heese, 2. Best Black Minorcas, cock and hen: Mrs Frisby, 1 and 2. Best Andalusians, cock and hen: Boots Metcalfe, 1. Best Buff Orpingtons, cock and hen: A C Buller, 1. Best Barndoor fowl (Boer Hoender), cock and hen: W S Jacobs, 2. Best three fowls for table use: J de Vos, 1. Best Muscovy, drake and duck: J S du Toit, 1. Best Aylesbury, drake and duck: H Heese, 1. Best Rouen, drake and hen: H Heese, 1. Best Pekin, drake and duck: H Heese, 1 and 2. Best drake and duck, any other breed: J H Adams, 1. Best three Bastards, for table use: S J Burger, 1. Best three Muscovies, for table use: S J du Toit, 1. Best Toulouse gander and goose: H Heese: Best Cape gander and goose: H Heese, 1. Best American bronze turkey, cock and hen: A C Buller, 1 and 2. Best turkey, cock and hen, any other breed: J H Adams, 2.

CEREALS.

Best bag Baard wheat. Quin Bros, 2. Best bag Du Toit's wheat: S J Kriegler, 1. Best bag rust-resisting wheat: F P de Wet, 1. Best bag any other variety, not classed above: F P de Wet, 1. Best bag Colonial barley · W H Naude, 1. Best bag barley-wheat. D P Krynauw, 2. Best bag oats: A H Viljoen, 1. Best bag rye: A H Viljoen, 1. Best bag yellow mealies: P Rabie, 1. Best bag white mealies, P and P Rabie, 1. Best bag sugar beans: F P de Wet, 1. Best bag Natal beans: E C Viljoen, 1. Best bag Zwartbekje beans: W Hugo, 1. Best bag any other kind of beans not classed above F P de Wet, 1. Best bag yellow peas: D F Viljoen, 1. Best bag green peas: W de V Rabie, 1 Best bag fine lentils: J de Vos, 1. Best bag coarse lentils: M P Rabie, 1. Best 100 oatsheaves: C Heatlie, 1 Best pressed oathay, not less than 150 lb: Fechter & Co, 1. Best bale pressed Lucerne, not less than 100 lb: A H du Toit, 1. Best 100 lb Lucerne seed, grown by the exhibitor. A P Burger, 1. Best six long mangel wurzels. J de Vos, 2. Best six round mangel wurzels: Deaf and Dumb Institute, 1. Best twelve carrots for cattle feeding: J P Malan, 1.

OSTRICH FEATHERS.

(Unwashed and grown by the Exhibitor).

Best 1 lb prime white feathers: Rabie, 1. Best 1 lb long drabs: Rabie, 1. Best 1 lb Feminas: Rabie, 1. Best 1 lb white tails; T and D Hugo, 1. Best variety of feathers not less than 1 lb 4 oz in all, and to be of not less than 10 distinct kinds, of not less than 2 oz, each, including as under: 1, whites; 2, long black; 3, medium blacks; 4, Feminas; 5, white tails; 6, B B. tails; 7, Femina tails: 8, medium drabs; 9, mottled; long drabs (silver medal and certificate): P and P Rabie, 1. Special: F Hooper (trimmed feathers).

FRUIT.

Plums.—Best collection of named varieties: Mrs J Meiring, 2. Best dish 12 damask: Mrs J Meiring, 1. Best dish 12 Burbank: P J de Wet, 1. Best dish 12 Kelsey: P J de Wet, 1. Best dish 12 Japanese, any other variety: F and Z du Toit, 1. Best dish 12 any other variety: P J de Wet, 1.

Apples. - Best and largest collection apples, six each variety: P J de Wet, 1. Best dish 12 Alexander: P J J Voesee 1. Best dish 12 Warners King (Versfeld); P J J Voesee, 1. Best dish 12 Warners King: D J J Joubert, 1. Best dish 12 Jonathan: Gie Bros, 1. Best dish 12 Ohenimuri: Gie Bros, 1 Best dish 12 Sturmer Pippins: Gie Bros, 1. Best dish 12 Wemmers Hoeks: Gie Bros, 1. Best dish 12 Lord Wolseley: Gie Bros, 1. Best dish 12 Agie: Gie Bros, 1. Best dish 12 Rome Beauty: P B Botha, 1. Best dish 12 Ribston Pippin: D J Joubert, 1. Best dish 12 Stone Pippins: D J Joubert, 1. Best dish 12 any other variety: P J de Wet, 1.

Grapes.—Best and largest collection, three bunches of each variety: A P Hamman, 1. Best and largest collection table grapes, three bunches of each variety, not less than four varieties: A P Hamman, 1. Best 20 lb red grapes, best suited for export: J C Rabie, 1. Best 20 lb white grapes, best suited for export: C Heatlie, 1. Best dish of four bunches white Muscadel: W de Vos Rabie, 1. Best dish of four bunches red Muscadel: W de Vos Rabie, 1. Best dish of four bunches white crystal: W de Vos Rabie, 1. Best dish of four bunches white Hanepoot: C Heatlie, 1. Best dish of four bunches red Hanepoot: C P Naude, 1. Best dish of four bunches Carbernet de Sauvignon: P and P Rabie, 1. Best dish of four bunches Canaan; S T Naude, 1. Best dish of four bunches Hermitage: S T Naude, 1. Best dish of four bunches white green grape: J C Rabie, 1. Best dish of four bunches red green grape;

J C Rabie, 1. Best dish of four bunches Barbarossa : D Kloppers, 1. Best dish of four bunches Stein : J C Rabie, 1. Best dish of four bunches French : H J Hugo, 1. Best dish of four bunches raisin blanc : Dr Hugo, 1. Best dish of four bunches any other variety : H C Meiring, 1.

PEARS.—Best and largest collection of pears, six of each variety : P J de Wet, 1. Best dish of six Bergmotte Cassane : S R Burger, 1. Best dish of six Duchesse d'Angouleme : P Brodie, 1. Best dish of six Saffron : P J J Voesee, 1. Best dish of six Doyenne de Comice : P J de Wet, 1. Best dish of six Louise Bonne : J N de Villiers, 1. Best dish of six Easter Beurre : Rev J Leipoldt, 1. Best dish of six Williams Bon Chretien : Gie Bros, 1. Best dish of Beurre Bosc : P J J Voesee, 1. Best dish of Beurre Diel : Gie Bros, 1. Best dish of six Keiffer : A H du Toit, 1. Best dish of six Winter Nelis : Mrs J J Joubert, 1. Best dish of six any other variety ; A H du Toit, 1. Best dish of six stewing : Gie Bros, 1.

PEACHES.—Best dish of twelve Late Crawford : Mrs McDonald, 1. Best dish of twelve Gladstone : Mrs J Meiring, 1. Best dish of twelve cling stone : Deaf and Dumb Institute, 1. Best dish of twelve Sea Eagle : P J van der Merwe, 1. Best dish of twelve Parvie : H Viljoen. Best dish of twelve Selway : Gie Bros, 1. Best dish of twelve Foster : P J de Wet, 1. Best dish of twelve brandywine : Gie Bros, 1. Best dish of twelve George's late cling : Gie Bros, 1. Best dish of twelve, any other variety : A P Hamman, 1. Best dish of twelve suitable for canning : H Viljoen, 1.

NECTARINES.—Best dish of twelve, any other variety (free stone) : P B Botha, 1.

FIGS.—Best and largest collection of figs, six of each variety : Dr Hugo, 1. Best dish of twelve Smyrna : A P Naude, 1. Best dish of twelve White Marseilles : J C Rabie, 1, Best dish of twelve Adam : Mrs J P Joubert, 1. Best dish of twelve, any other variety : P J van der Merwe, 1.

CITRUS FRUIT.—Best dish of twelve Portugal lemon : P J de Wet, 1. Best dish of twelve Cape lemon : A P Hamman, 1. Best dish of twelve citrons : Gie Bros, 1. Best dish of twelve Pompelmous : C Heatlie, 1. Best dish of twelve oranges : P J de Wet, 1.

MELONS.—Best melon, green flesh : Dr Hugo, 1. Best melon, any other variety : N Heatlie, 1.

WATERMELONS.—Best watermelon, ice cream : J C S Deetlefs, 1. Best watermelon, ice rind : J C S Deetlefs, 1. Best watermelon, any other variety : P J J Voesee, 1.

MISCELLANEOUS.—Best dish of six pomegranates : F Lindenberg, 1. Best six quinces : A R Hamman, 1. Best dish Cape gooseberries, not less than 4 lb : P C B le Roux, 1.

FRESH FRUIT PACKED FOR EXPORT : Best packed box grapes : Naidoo and Co and R M Naidoo, equal, 1. Best packed box pears : J P Roux, 1. Best packed box apples : C J Joubert, 1. Best packed box plums : C J Joubert, 1. Best packed box tomatoes : C J Joubert, 1.

DRIED FRUIT : Best 20 lb dried apricots : R Falcon, 1. Best 10 lb dried prunes (plums) : Donkerhook Fruit Syndicate, 1. Best 20 lb dried peaches (peeled) : W H de Vos, 1. Best 25 lb sultanas : F Tesselliar, 1. Best 10 lb mebos : W van der Merwe, 1. Best basket almonds : A H du Toit, 1. Best assortment of the greatest variety of dried fruit : G J Marais, 1 ; W van der Merwe, special.

VEGETABLES.

Best basket early rose potatoes : W Rabie, 1. Best basket magnum bonum potatoes : D Klopper, 1. Best basket up-to-date early potatoes : D J le Roux, 1. Best basket any other variety of potatoes not classed above : D J le Roux, 1. Best two baskets onions, red : A P Kloppers, 1. Best two baskets onions, white : J and C Naude, 1. Best two baskets onions, any other variety, any other variety : P Kloppers, 1. Best one basket onions, for pickling : F de Wet, 1. Best lot French beans : J P Malan, 1. Best three early pumpkins . A J Beukes, 1. Best three common pumpkins : P J de Wet, 1. Best three long vegetable marrow : S J Burger, 1. Best three custard vegetable marrow : J P Malan, 1. Best basket sweet potatoes (Natal) : D W Viljoen, 1. Best basket sweet potatoes, any other variety : D W Viljoen, 1. Best three long cucumbers : J P Malan, 1. Best three cucumbers, any other variety : J P Malan, 1. Best lot round tomatoes : P J D Stoffberg, 1. Best lot flat tomatoes : P J D Stoffberg, 1. Best lot tomatoes for export : J P Malan, 1. Best six round beetroot : J P Malan, 1. Best three cabbages, sugar loaf J P Malan, 2. Best three cabbages, round: S J Burger, 2 Best two bunches long radishes: Dr Hugo, 1. Best two bunches round radishes J P Malan, 1. Best twelve turnips for table use: Mrs Joubert, 1. Best twelve stalks rhubarb: Deaf and Dumb Institute, 1. Best bunch of twelve scorzonera: J P Malan, 1. Best bunch long parsnips: Mrs Joubert, 1. Best bunch round parsnips. S J Burger, 1. Best bunch long carrots J P Malan, 1. Best bunch round carrots: J P Malan, 1. Best and largest collection of vegetables. J P Malan, 1. Specials: N K Krone, jun, and G J Roos.

WINES, SPIRITS, ETC—FARMERS' COMPETITION.

Best leaguer dry red Muscadel, vintage 1904. A P Burger, 1. Best leaguer white Jeripico, vintage 1904: T and D Hugo, 1. Best leaguer hock, vintage 1904: T and D Hugo. Best leaguer red Jeripico, vintage 1904: T and D Hugo, 1. Best leaguer natural (unprepared) table wine, any kind, vintage 1904: A P Burger, 1. Best leaguer Dop brandy, 10 per cent. under proof, Sykes. A P Burger, 1. Best hogshead grape vinegar, vintage 1904. A P Burger, 1.

MERCHANTS' COMPETITION.

Best six leaguers Colonial dry sherry: E K Green and Co, 1. Best six leaguers Colonial medium sherry E K Green and Co, 1. Best six leaguers Colonial dry Pontac: H C Collison, 1. Best six leaguers Colonial port wine: E K Green and Co, 1. Best six leaguers Colonial hermitage: E K Green and Co, 1. Best six leaguers Colonial hock: Western Wine and Brandy Co, 1. Best six leaguers Colonial cognac: E K Green and Co, 1. Best six leaguers Colonial old Dop, 10 per cent under proof, Sykes: Krone and Co, 1. Best six leaguers spirits of wine, 58 per cent. over proof, Sykes: Western Wine and Brandy Co, 1. Best six leaguers spirits of wine, 54 per cent. over-proof, Sykes: Western Wine and Brandy Co, 1. Best six leaguers spirits of wine, 65 per cent. over-proof, Sykes. Western Wine and Brandy Co, 1. Best collection Colonial liqueurs, not less than six varieties: Western Wine and Brandy Co, 1.

TESTS OF SUBSTANCES FOR TICK DESTRUCTION.

By C. P. Lounsbury, Government Entomologist.

The following report dated Dec 22nd, 1904, was submitted by the Government Entomologist to the Chief Veterinary Surgeon :—

. During the past year, I have taken advantage of the facilities at the Animal Diseases Experiment Station, Rosebank, to conduct in connection with other experimental work involving ticks, numerous tests having for their general object the increase of our knowledge on the action of substances that may be employed for the destruction of ticks on their hosts. These tests were all made with your approval, and from time to time the results that had been obtained were communicated to you verbally; but as the practical application of deductions from such tests is a phase of the work of your branch of the Department, it seems to me desirable that I place you in possession of the essential details in writing: hence this memorandum.

The actual conduct of all the dipping and spraying in connection with the tests was left to the supervision of my Assistant at the Station, Mr. R. W. Jack.

Tests of Arsenical Preparations.

These tests, to some extent, are in continuation of those I conducted conjointly with Mr. L. J. Roberts at his farm in the Fort Beaufort district in 1899, and 1900, and on which reports were made to you at the time. Mr. Roberts and I found that plain arsenite of soda (scrub exterminator), with or without the addition of soap, was a cheap and efficient preparation for destroying ticks. Since that time dips for tick destruction, based on formulæ evolved in Queensland and containing soap and Stockholm tar in addition to arsenite of soda, have come into use. The addition of the tar adds very heavily to the expense of arsenical dips, and I estimate that it costs a farmer five to ten times more to dip in a tar-arsenic dip than it would to dip in a solution of scrub exterminator containing the same amount of arsenic. The scrub exterminator now imported by the Government costs about £25 a ton in England, and under 3d a pound landed in the Colony. It contains about 66 per cent. of arsenic ($As_2 O_3$) according to an analysis recently made at my suggestion by the Government Analyst.

The advantages of having Stockholm tar an ingredient of tick dips are said to be: that tar is well known to quickly kill ticks, that it is an excellent dressing for wounds, and that it must act as a preventive for tick attack both by itself and by causing arsenic to adhere. I do not know that practical experience has borne out the assumption that the tar when combined with the other ingredients adds any of these advantages. Stockholm tar is certainly death to ticks when applied to them undiluted, this fact being long known and made use of by Cape farmers; and there is also no doubt that its reputation as a rough and ready antiseptic dressing for wounds is well deserved. But there has seemed to me reason to fear that it loses these virtues to so great an extent when it is boiled with alkali until it is miscible with water and then diluted for dipping that what little advantage its presence might add to a dip would be far outweighed by disadvantages.

Tar-Arsenic Dip versus Plain Arsenic Solutions.—Tests by dipping on an extensive scale are desirable if not actually necessary to conclusively determine upon the relative merits of tar-arsenic dips and plain arsenite of soda with or without the addition of soap or extra alkali. That it would be highly profitable to have such extensive comparative tests conducted is strongly indicated by the results of the few comparative spraying tests which have been made at Rosebank. These tests were all made on stabled cattle. The general plan was, from time to time, to very heavily infest the cattle that were resting from disease infection experiments with bred larvæ of the common Blue Tick; and when the ticks were beginning to swell out as adults, to very thoroughly spray these animals with the preparations to be compared; daily observations were then made to note the effects, and collections of female ticks that swelled up were set aside over damp sand in glass dishes to ascertain if eggs would be laid and if eggs laid would have vitality. One to six animals, but generally one or two only, were used for each test. The substances compared, the estimated arsenical strength of the dilutions of these employed, and the number of times the various strengths were tried, are shown by the following table.—

Substance.	Dilution with water.		Estimated Arsenical Strength.		Times Tested.
	lb.	gals.	lb.	gals.	
Demuth's Dip	1	6	1	65	
Do.	1	4	1	44	
Do.	1	2¾	1	30	
Alderson's Dip.. ..	1	21	1	45	
Do	1	14	1	30	
Scrub Exterminator ..	1	52	1	78	
Do. ..	1	40	1	60	
Do. ..	1	30	1	45	
Do. ..	1	20	1	30	

Demuth's Dip is a tar-arsenic-soap dip which was put on the market as a result of your recommendation to Mr. Demuth to prepare a dip after the common Queensland formula. The estimate of the proportion of arsenic in the dilutions tested is based on the statement of the maker on the percentage of arsenic in the concentrated dip. The dilution for use recommended by the maker is equivalent to the weakest mixture tested, that is 1 lb. to 65 gallons. Alderson's Dip is another proprietary article. When the first tests were made with it, the nature of its ingredients were not known to me. Later an analysis of a sample was made by the Government Analyst. No tar or soap was found but a high percentage of arsenic and soda. The statement of the proportion of arsenic to the water in the dilutions tested is based on this chemical analysis. The strength recommended by the makers is equivalent to the 1—30 dilution of the table. As already stated, an examination by the Government Analyst showed the scrub exterminator to contain about 66 per cent. of arsenic, and my estimate of the arsenical strength of the dilutions rests on this basis. The most dilute scrub exterminator (1 lb — 78 gals.) was used in one test pure, in two tests with an equal weight of soap (that is a pound of soap to a pound of scrub exterminator), in two tests with an equal weight of Hudson's soap extract, and in two more with half the weight of soap extract. The stronger solutions of scrub exterminator were all used pure.

The degree of success in destroying the ticks varied a little in the different tests of exactly similar preparations, a lack of uniformity in the action of arsenical washes which is perhaps directly or indirectly due to atmospheric conditions; but the tests resulted in convincing me that the three substances varied little if at all in their effect upon ticks when used at the same time on the same age of ticks and at the same arsenical strength, and with all the other conditions similar. In other words, no gain in the direct effect on ticks was observable from the presence of tar and soap in Demuth's Dip. It did seem as if the results with the most dilute scrub exterminator used pure were slightly inferior to those with the same strength used with soap and the soap extract, but what slight distinction was noticeable may have been due to other factors. It was several times observed, for instance, that when two or more animals were used in one test, the effect on the ticks infesting one animal were slightly more pronounced than on another.

Most of the sprayings were done on the eighteenth or nineteenth day after the application of the larval ticks, that is just at the time the most advanced females were beginning to swell. It was found that the small ticks were easily destroyed but that those females that were much swollen at the time of spraying were acted upon so little or so slowly that they continued to swell and were apt to complete their growth, often, however, only to succumb later. It was supposed that the early death or otherwise of the females that thus matured would serve as an accurate index to the relative efficiency of the various sprayings. With this idea as many as swelled, up to a maximum of one hundred, were removed systematically from the sprayed cattle on the first, second and seventh days after the treatments and set aside over sand. Only a rough idea of the relative efficiency, however, was obtained by this means. The atmosphere of the dishes in which the ticks were kept always became more or less fouled by the decay of the specimens that succumbed, and although the specimens seen to be decaying were removed every few days, there is no doubt that the well-being of those that remained was affected seriously; and moreover the ravages of the maggots of a tiny species of fly, which despite all we were able to do, gained entrance to most of the dishes, further confused the results due directly to the spraying.

Only the preparations strongest in arsenic, that is those used that were estimated to contain one pound of arsenic to thirty gallons of water, ever destroyed *all* of the ticks; in most cases even these strongest mixtures failed to prevent a few females from maturing. Most such females, however, died without laying eggs, and nearly all the eggs that were laid failed to hatch. The weakest preparations killed nearly every newly moulted adult, any larvæ that were present, any young nymphs, and ultimately a large proportion of the fed nymphs but failed to prevent most of the females that had begun to swell visibly from maturing normally and laying eggs that proved fertile. The intermediate strengths prevented a much larger proportion from maturing, and although some hundreds generally appeared scattered all over the body less than half of those that were set aside in dishes survived to lay eggs.

If the cattle had been infested daily with a few hundred ticks as might occur under natural conditions on the veld instead of being infested on one day by tens of thousands which would mature at about one time as was done for the tests, it is quite probable that the effects of the intermediate strengths, that is those containing a pound of arsenic to forty five gallons of water, would have been considered highly satisfactory and good enough in practice. The common Queensland formula calls for one pound of arsenic to fifty gallons, and although at this strength the dip has the reputation of killing every tick, it is highly probable in the light of our results that a small proportion always escapes if ticks are present in all stages of growth.

It will be noticed that the strong mixture of Alderson's Dip used (1 lb. to 14 gals. water) is the strength recommended by the vendors. According to the Analyst's report, the dip contains at this strength about 65 per cent. more arsenic than is called for by the Queensland formula. Its success was fully equal to that of scrub exterminator used at what were estimated to be the same arsenical strengths.

If my information as to its percentage of arsenic is correct, and I believe it is, Demuth's Dip is recommended for use at an arsenical strength about thirty per cent less than the Queensland standard. When used at this strength, the dip proved uniformly unsatisfactory in the test; most of the swollen females continued to swell and those set aside practically all laid healthy eggs. When the dip was used in dilutions estimated to contain the percentage of arsenic present in Alderson's Dip, however, it appeared to act as successfully as that preparation, but not more so.

Arsenic as a Tick Deterrent.—In order to determine if any deterrent action was exercised, and if there *was* such action if it were more evident with a tar-arsenic-soap dip than with plain arsenite of soda, the cattle sprayed with the weakest solution of scrub exterminator and those sprayed with the weakest mixture of Demuth's Dip were afterwards purposely very heavily infested with larvæ of the Blue Tick. Some of the lots of ticks were applied the same day as the spraying, others on the following day, others on the fourth day afterward, and still others on the seventh day. It was found that the larvæ spread over the skin and settled down to feed in the normal manner; but that, practically, all applied within two days of the spraying perished on the skin within a few days, and that the same fate befel the majority applied on the fourth day, whilst there seemed to be no heavy mortality amongst those applied on the seventh. Incidental to other experiments small lots of Brown and Bont Tick nymphs and adults have been applied to a few animals one or two days after spraying with arsenical preparations and in these cases no mortality has been observed that could be ascribed to the treatment; so the impression is left that the tiny larvæ are more easily affected than the nymphs and adults.

It was quite expected that the tar-arsenic-soap dip would prove a much better destroyer of ticks which came on after spraying than the solutions of scrub exterminator; but no superiority in this direction was shown, although the scrub exterminator contained slightly less arsenic, nor did the mortality appear any greater on the animals which received soap mixed with the scrub exterminator than on the one which received the arsenic solution only.

Effect of Arsenical Sprays on Cattle.—The spraying in none of the tests above reported appeared to harm any of the cattle in the least. The animals were all watched for sores, swelling and stiffness, and for effect on the appetite and bowels. It is quite possible that slight stiffness may have sometimes been present unobserved, as such a symptom might easily pass unnoticed in cattle kept continually in the stable, as these were.

When the tests were first started, two cattle were sprayed in error with Alderson's Dip at ten times the strength recommended in the maker's direction, one part being used to fourteen parts of water instead of one pound to fourteen gallons. Both animals succumbed within forty-eight hours, and the post mortem examination by Mr. Robertson left no doubt that they had died fron arsenical poisoning; practically the whole of the subcutaneous tissue was frightfully inflamed.

To get some indication whether or not it is safe to spray cattle repeatedly with a solution of scrub exterminator at a strength which is fairly effectual for the destruction of ticks, two cattle were sprayed weekly from August 15th to November 21st. Of the fifteen sprayings in the interval, thirteen were with scrub exterminator at the rate of one pound to twenty-five gallons of water; one with a similar solution containing the same weight of soap as of the arsenite, and the fifteenth with an equally strong mixture of Demuth's Dip; the proportion of arsenic, on the bases of analyses mentioned above, was estimated at one pound to thirty-seven gallons of water, which is one-third more than is called for by the standard Queensland formula. No ill effects whatever on the animals were observed until after the fourteenth spraying and then all that was noticed was that one had a superficial sore about the size of a shilling on the underside of the tail near the root. The origin of this sore is in doubt, but I think that the arsenic at least retarded its cure; it has healed nicely in the fortnight since the last spraying. One of the animals was a bull and the other a heifer; both were between two and one-half and three years old.

Effect of Frequent Arsenical Dipping on Sheep.—Owing to a suggestion that all stock, large and small, grazed within ten miles of the Transvaal border in Bechuanaland, should be dipped once a week as a precautionary measure against the introduction of African Coast Fever, I thought it advisable to make a few tests at the Experiment Station that would give us an idea whether or not a heavy mortality amongst sheep would result from frequent dipping. The sheep used were mostly animals which had survived heartwater and for which we had no further use; it was unsafe to let them leave the Station alive, and few of them were in good enough condition for slaughter.

1. The first test was with two Persian wethers (Nos. 154 and 195) in very good condition. They were both covered with hair about one and one-half inches in length and as dense as this breed ordinarily carries. The dipping was in a solution of scrub exterminator of the strength used for spraying the two cattle mentioned above, namely one pound to twenty-five gallons of water· which is estimated to be one pound of arsenic to thirty-seven gallons. In this and the other test to be discussed, the animals were kept immersed about one minute. All the care ordinarily exercised was taken and the animals allowed to drain in the gravelled yard away from food; after they had wholly ceased to drip they were put back in their shed. Owing to the manner in which we confine our sheep in stanchions, there is almost no chance of their eating what they stand upon. The first dipping of the two Persians was on August 15th, and the subsequent dippings at intervals of one week.

One of the sheep succumbed the day after the second dipping. The post mortem examination by Mr. Robertson showed intense subcutaneous inflammation all over the body, and intestinal lesions of arsenical poisoning. The temperature of this animal was continually two degrees or more above the normal from the day of the first dipping.

The second animal did not appear injuriously affected until the third dipping; then some of the hair on the under parts began to slough, and the temperature ran above the normal. After the fourth dipping, the temperature ran still higher, and on the day following the fifth, the animal succumbed very suddenly. The usual intestinal lesions of arsenical poisoning were found by Mr. Robertson at the post mortem examination; and, as with the first case, the whole subcutaneous tissue was much inflamed. The thigh muscles on one side were discoloured and infiltrated with clear fluid to a depth of fully half an inch.

There seemed no doubt whatever that the death of both of these animals was due to absorption of arsenic through sound skin, and that it was therefore dangerous to dip fat Persian sheep in so strong a solution of the form of arsenic used.

2. The next test was with two large merino wethers (Nos. 160 and 183) in fair condition and heavy wool: the staple was thick and about two and one-fourth inches in length. The dip for the animals was scrub exterminator at the same strength as used for the Persians but with the addition of the same weight of soap as of the arsenite. The first dipping was on September 20th, and the secomd one week later.

Both animals succumbed during the night following the second treatment; and as in the previous cases, great subcutaneous inflammation pointed to absorption of arsenic through the skin.

3. A third merino (No. 144) in about the same condition as the other two but with wool only three-fourths of an inch in length, was dipped with them on September 20th, and in the same strength of arsenite again on October 4th. After that it received a weekly immersion in a solution two-thirds as strong, that is one made of one pound of scrub exterminator to thirty-seven gallons of water or estimated to contain arsenic at the rate of one pound to fifty gallons. After the third dipping, the animal's temperature ran abnormally high and on the day after the sixth dipping, November 1st, death took place. There was no loss of wool in this case, but subcutaneous, stomach and intestinal lesions could hardly have been worse.

4. Two Afrikander ewes, (Nos. 247 and 251), one four tooth and the other six, both in very poor condition, and both bearing coarse wool about one and one-half inches long, were dipped on September 27th and again on October 4th in scrub exterminator at the one pound to twenty-five gallons strength. Owing to the experience with the other animals, the dip was then weakened to one pound to thirty-seven gallons and the treatment continued weekly until November 21st when the work was discontinued. Although both animals have survived, they certainly would have died had they been dipped much longer. Altogether they were dipped nine times. Their wool began to slough after the fifth and sixth dippings, respectively, and the and the condition of the skin became worse with each subsequent dipping. At first the wool along the belly fell out, then that on the thighs, face, and flanks; at the end a slight pull would detach a lock from almost any part. Some sores formed on the bare parts, and altogether the animals presented a most wretched appearance. The temperatures, however, kept almost normal. Since dipping ceased, the animals are improving both in health and appearance.

5. A merino, No. 242, in poor condition and bearing wool about an inch and a half in length, was dipped with the preceding animals from October 11th in the same strength of scrub exterminator—one pound to thirty seven gallons. It succumbed the day following the fourth immersion. There was the usual subcutaneous inflammation, and profuse œdema of a jelly-like consistency about the abdomen, and flanks; the fourth stomach was much inflamed and also the intestines. There had been little sloughing of wool except from about the ears.

6. A small Afrikander goat, perhaps two years old, was dipped in the solution containing one pound of scrub exterminator to twenty-five gallons of water on August 29th, September 5th, and 12th, and again October 4th without doing it any harm as far as could be noticed. From October 24th, it was dipped weekly (along with the sheep) in the solution containing one pound to thirty-seven gallons, and appeared none the worse for the treatment when the experiments were stopped, November 21st. Altogether it was dipped nine times in three months. Its hair did not become loose.

7. The last tests were with Cooper's Dip. Four animals were used, and the strength of the mixture was in accordance with the directions given on the packets, that is, one packet to twenty-five gallons.

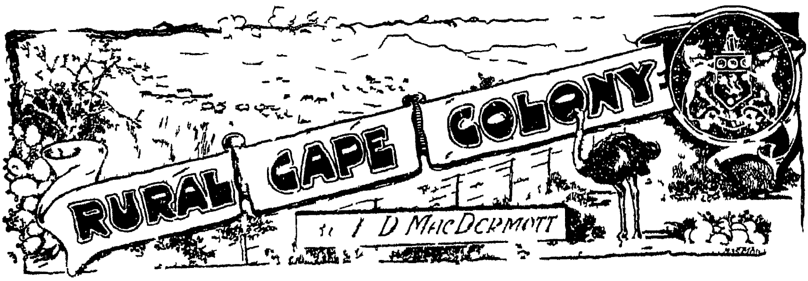
The first sheep was No. 250, a four tooth Afrikander wether in poor condition and with wool about one and one-half inches long. It was dipped on September 27th in scrub exterminator at the strength of one pound to twenty-five gallons of water, and each week subsequently in Cooper's Dip. It succumbed during the night after the sixth dipping and the post mortem appearances were much as usual. Portions of the face, the inside of the thighs, the belly and the right flank had become denuded of wool.

No. 256, also a four tooth Afrikander wether and similar in condition as regards flesh and wool, received the same treatment as No. 250; but it survived for nearly three weeks after the last dipping. After the sixth dipping, the wool began to slough from the inside of its thighs and its belly, and after the ninth and last, little wool was left along the sides and a large sore had formed on the denuded surface The animal was prostrate and in great pain for a day or two before its death. Mr. Robertson found no pronounced subcutaneous lesion, but deemed that death was due to slow arsenical poisoning; the intestines were acutely inflamed and appeared to have been in this condition for some time.

No. 246, an Afrikander ewe, similar in age and general condition to the last two sheep, and No. 153, a Persian wether in fairly good condition, were dipped weekly from October 11th in the normal strength Cooper's Dip. Both animals began to lose the wool from the inside of the thighs and the belly after the fourth immersion. The Persian died during the night after the sixth, by which time most of the wool had fallen from the under parts. The Afrikander has survived its seventh and last dipping, but has lost most of the wool from its belly and lower parts of its sides.

The temperature of all the four sheep dipped in Cooper's preparation was irregular and generally abnormally high during the continuance of the tests. The same was true of most of the sheep dipped in the solution of scrub exterminator. The better in condition the sheep were, and the heavier their covering of wool, the quicker they appeared to suffer from the dippings.

The results of these tests give one every reason to fear a very heavy mortality should woolled sheep be dipped at short intervals in an arsenical dip of sufficient strength to be efficacious against ticks. A solution of scrub exterminator at the strength of a pound to thirty seven gallons is no richer in arsenic than a dip made in accordance with the Queensland formula, whilst Cooper's Dip at the normal strength contains a smaller proportion of arsenic.



NO. XI

THE DISTRICT OF STUTTERHEIM.

(*Continued from page* 245.)

Leaving the Waterford Estate, in the company of Mr. G. W. Turpin, who was kind enough to drive me over the next stage of my journey, we passed over the properties of Col. W. J. Warren, M.L.A. The first one, "Bleak House," which immediately adjoins the Waterford Estate, is devoted almost entirely to stock, the well-known strain of shorthorns, which have often figured prominently at Border shows, being located here. Col. Warren's headquarters, however, are on the adjoining farm, "Cloverdale" which he purchased a while back from the estate of his deceased brother, the late John Warren, a progressive farmer of some note in these parts. Neither "Bleak House" nor "Cloverdale" could be classed as agricultural farms in the full sense of the word, and in drought such as that which held the country in its iron grip at the time of my visit, one could not expect to see much cultivation. But tree-planting has been followed with some success and a few closely sown belts of eucalypts and acacias speak volumes for the prospects of this form of cultural industry in the future. At present these belts and clusters of foliage serve the very useful purpose of supplying shade and shelter for stock. The cattle are all good and well selected, being mostly pure shorthorns—of the red Lincoln type—and crosses of that breed on the cows of the district. The resulting strain is spoken of very highly, and in favourable seasons the herds thrive apace and bring big returns. But the days of good seasons seem passed and the most the farmers hereabouts can do just now is to keep their heads above water.

THE REDWATER SCOURGE.

These are Redwater infected areas and the cattle farmers are constantly on the alert against this direful scourge Of course, as is generally known, the presence of the organism renders the locally bred stock more or less immune to the disease; but in the case of cattle imported from non-infected areas in this country, and from oversea, the greatest care has to be exercised. The usual treatment with imported cattle is to take the risk and inoculate them as soon as is convenient after getting them on to the farm, and it is really surprising how small is the percentage of loss. Of course there are losses and the risk is considered great by some of the pastoralists of the district, but those with the courage of their convictions continue to import, and pin their faith to inoculation. As the results, on the whole, are fairly satisfactory there is no reason apparent why, with perseverance in this direction, the cattle industry including dairying on a large scale, should not expand to really serious dimensions. It all seems to resolve itself into a question of storing sufficient fodder to carry on through the periodical drought.

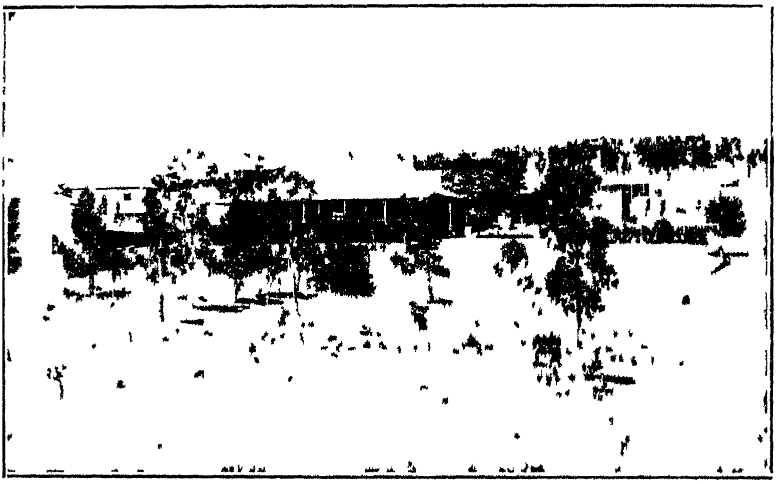
Cloverdale, the Homestead of Col. Warren, M.L.A

The farmer who first solves this problem is going to help the whole of this section as no man has ever helped it before. In addition to the precautions against redwater practised as above by the cattlemen of this district they are seriously facing the question of dipping. The ravages of ticks are fully recognised hereabouts and their danger to stock as the bearers of disease, so we find the

PRIVATE DIPPING TANK

is making its appearance here and there. Col. Warren is so firmly convinced of the imperative necessity of dipping, if the stock farmer is to hold his own, that he has constructed an excellently equipped cattle dip on his farm "Cloverdale" though which all his large stock are being regularly passed. He is a follower of the Government Entomologist in his belief in the possibility of reducing the tick pest by means of dipping and is fully determined to give the theory a trial. This is a progressive district, and the value of dipping for sheep has long been accepted as a cardinal point in all good husbandry. The whole district is fairly free of scab and other preventible diseases and it seems quite probable that in a few years, by the aid of dipping, the cattle of the country will be benefited in the same way by keeping down the race of pathogenic ticks—the disease transmitters of this particular region.

"Cloverdale" also carries some splendid flocks of woolled sheep—mostly of the Australian Merino strain; and the clip is a well-known mark in the East London produce market. Well packed, sorted, and well grown, Col. Warren can always command full values when his sample bales are opened out before the buyers.

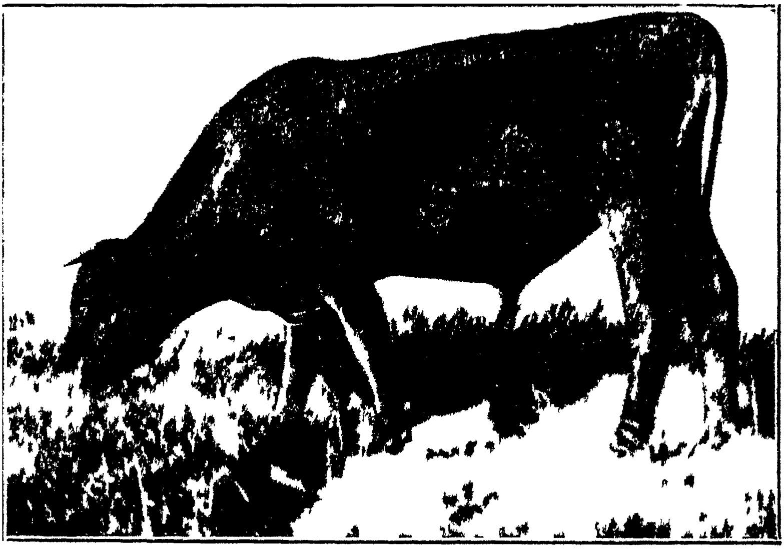


Ripplemead, Kubusi, the Homestead of Mr R. Pell Edmonds

The farm is excellently fenced and laid out in paddocks, and gives one the impression of being excellently suited for trial sowings of *Paspalum dilatatum*. When one sees how well this grass thrives about here in small plots it is impossible not to express surprise that so little is being done to propagate it. I understand that several farmers are now trying it, and a firm of East London merchants is pushing the sale of the seed, but it cannot be said to have "caught on," in the same way that it has in Australia.

YORK VALE—THE KUBUSI AGAIN.

After leaving Cloverdale a short drive over a dividing belt brings one again into full view of the Kubusi River which winds its way like a silver streak through the whole district. The country hereabouts is very similar to that we have just passed through, except that the river is gaining in volume as it flows. Yore Vale is an expansive valley sloping gently down towards the river on the south bank, and includes a fairly wide stretch of arable land which must yield large crops when the seasons are favourable. It is a pretty sight even in a drought to see the large extent of cultivated land lying along both banks of the river and the comfortable looking homesteads each with its own plantations and fringe of orchard. Some years back a settlement scheme was attempted here, and the result was fairly satisfactory up to a certain point. But the immigrants have very few representatives here now, most of the allotments having been bought up and included in the grazing lands of the large proprietors. One of the features of the valley is the nursery of Messrs. Robinson Bros., who carry on a thriving business,



Imported Welsh Bull, in the Veld at Ripplemead

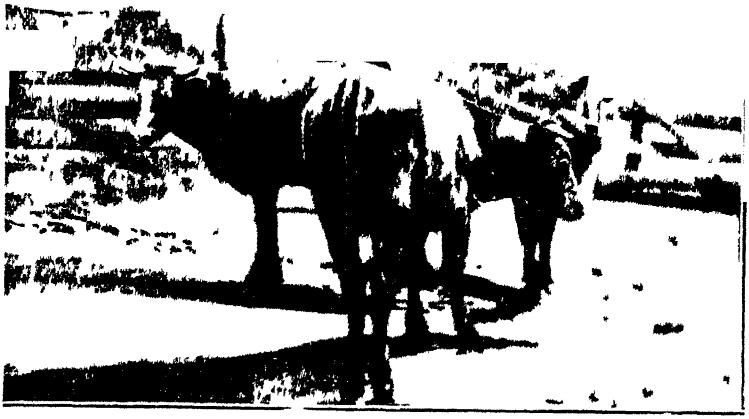
I understand. For the most part, however, the staple industry is stock and the arable farmer has a very poor time of it. That is one of the causes of the settlement scheme having failed—so the neighbours say. The original allotments were too small for stock and attempts to live by arable farming were doomed to failure owing to the uncertainty of the seasons. Guiding themselves by the light of past experiences the farmers of this section seem deeply convinced that arable farming can never be a success. That may be admitted, if the farmers' efforts are to be confined to arable work entirely; but there is the happy medium known as mixed farming which ought to command more attention. The fixed idea that crops should be grown for market—must, of course, be set aside in a country where the rains are so unreliable. But the production of crops as a standby in bad times might be given more consideration with the prospect of profit and relief from many troubles. With a water supply like the Kubusi it should be possible to carry a great deal of stock hereabouts if a scheme of fodder storing became more general. These grass sections are all so good in good seasons that farmers are apt to forget that the bad times are bound to come round again. But after the bitter experiences of the past few months this question is bound to come up for serious consideration. It is cattle and large stock that are wanted in a country of this description and to make cattle pay, the first essential is to build up a dairying industry. The tick is the most serious obstacle here, and the irregularity of the seasons the next, but neither are insuperable, and the introduction of a fodder of a drought resistant type like *paspalum dilatatum* and the more general adoption of the systematic dipping of large stock, as well as sheep and goats, offers the solution of the more serious of the farming problems of this section. The magnificent sheep farms one sees here show what can be done by foresight and intelligently directed energy. And it must never be forgotten that the sheep farmers have had to overcome obstacles quite as serious in their nature as any that now face the cattle farmers. Their industry is subject to the fluctuations of the markets of the world, and it is hopeless for them to expect any protection for their staple product—wool. But cattle farmers have a bright future before them in dairying if they would only realise their opportunities.

THE LESSONS OF TEXAS AND AUSTRALIA.

It is impossible not to be forced back upon the modern history of other countries similarly placed to our own when one moves through a section like this. Cattle farmers have serious trouble here but they are only going through the experiences which have made other countries successful. In the State of Texas the cattle industry seemed doomed beyond hope at one time, entirely owing to the ravages of the disease we know as redwater—there called Texas fever. Yet the mainstay of Texas to-day is the production of fat stock for the Chicago meat packers. The change was not brought about all at once; it took years to accomplish—and the result stands as a lesson to the world.

The lesson to be learned from Australia carries us a step further. The general idea of Australian farming is that gathered from the fascinating descriptions of the huge sheep stations with their immense runs—or veld, as we should call it—and the periodic fluctuations caused by bad markets and drought. This is not the real Australia from the farming point of view. The real Australia, as far as farming is concerned, consists of the hundreds and thousands of men working small sections of ground, cultivating every inch of it, yet sending nothing away but animal products. When Australia was at its lowest ebb, it may be truthfully said that dairying and the smaller farming industries saved it. The co-operative creamery and the intensive cultivation of small holdings have done more for Australia than all her goldfields, for they have brought upon the land a large and ever-increasing population that lives in comfort, and thrives by the pursuit of these industries. So successful are these small farmers that the Governments of most of the Australian States set aside considerable sums annually to purchase large estates as they fall into the market, and cut them up into small holdings for the class of farmer described above.

What has been, and is being, done in Texas, Australia—and New Zealand as well—can assuredly be done in this Colony, where the conditions are, in reality, more favourable. Here there is no need to seek a market for dairy produce. All that is necessary to kill all competition is a regular supply marketed at reasonable rates. Once a full supply, say of colonial butter, is assured at prices that will compete with the oversea product, the imports of that staple article of consumption will soon diminish, and ultimately cease altogether. The same applies to cheese. And with the successful prosecution of these industries, meat will again become a crop of importance to the farmers. It is all a question of supply and demand. The demand exists, and must ultimately be met. But the oversea competition will never be entirely overcome until the merchants of this country can be assured of regular supplies of the local product. And this all brings us back to the root of the problem, viz., provision of fodder for times of scarcity.

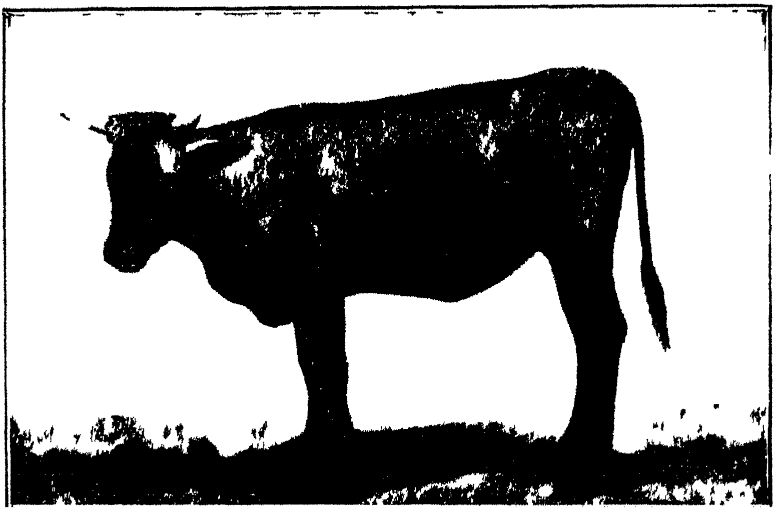


Group of Young Welsh Cattle at Ripplemead.

"RIPPLEMEAD."

A good deal of the above is a condensation of the conversation which passed between Mr. Turpin and myself as we drove towards our objective—"Ripplemead," on the Kubusi, the home of Mr. R. Pell Edmonds, a sheep farmer and stud breeder of some notoriety.

"Ripplemead" is situated at the top of a hill overlooking the Kubusi River, the altitude being some 300 feet above the bed of the stream, but it is scarcely a mile from its banks. The dwelling house is very substantially built of stone, as also are the outbuildings. The farm itself is singularly well situated, having a river frontage to the Kubusi of some five miles, and on the Golongi, a tributary of the former, of another four miles or so. Yet owing to the contour of the country very little advantage can be taken of these favourable conditions and very little cultivation is carried on, while the irrigable area is nil. A former proprietor had a very elaborate scheme for bringing the waters of the Kubusi up to the homestead, and from there distributing them over cultivated lands, in which he proposed to plant permanent crops. The work was carried out so far as to cut a furrow for some distance along the bank of the river. This leading was supposed to work a hydraulic ram to lift the water to the top of the hill, but as the farmer failed, the scheme failed with him, and there the matter has rested. Mr. Edmonds also owns the adjoining farm of Winkelhurst, which has a big stretch of river frontage running for some nine miles. Here some 500 acres could be brought under the plough, but only some 50 to 60 are cultivated, and these are watered from a furrow led out of the river higher up.



Imported Welsh Heifer, "Plas Pet," at Ripplemead.

Stock is the main interest here, and not such a bad interest either, when one learns that on the 5,000 acres as many as 5,000 sheep can be run and 120 head of cattle. All the stock runs night and day, a great advantage when jackals are not too plentiful, a happy condition which seems to prevail here. Mr. Edmonds has strong ideas in support of the jackal subsidies by

Government, and hopes some day to see jackal proof fencing more generally adopted. He has not reached that condition himself yet, but, as remarked above, he has hopes Lucerne has been tried on a fairly large scale, but did not succeed very well. In fact it seems not to take kindly to any of the country hereabouts, probably owing to deficiencies in the soil constituents. Paspalum, on the other hand, is being sampled with some prospect of success, and I should not be surprised to hear before long that large areas were being planted with that grass. Trees have been tried, but do not thrive very well, neither does the small orchard planted just below the house, but Mr Edmonds is still sanguine of success in this direction, and looks forward to the day when he will be able to realise the scheme initiated by his predecessor, and lift the water from the Kubusi to keep his orchard and plantations from falling back in a drought.

Black Welsh Cattle.

The bulk of the cattle on this property are Frieslands of an excellent stamp, but within the past two years Mr. Edmonds has gone in for another venture of an entirely different nature. When in England in 1903 he visited the Royal Agricultural Show, where he was much taken with an exhibit of black Welsh cattle. He made enquiries and found that not only were they hardy, and possessed many other virtues, but that they had a good record at the pail. Feeling they might suit South Africa, he brought some out with him, and they are now thriving very well indeed in their new surroundings. I secured a couple of snap-shots of them which, I fear, do no

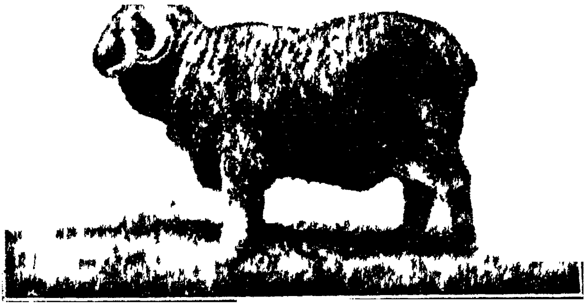
Group of Stud Ewes at Ripplemead

more than give an idea of what they are like. They certainly do not flatter them, but though they were suffering from the drought like everything else at that time, they looked fairly well, and though not in show condition, seemed thriving. Mr. Edmonds brought out two bulls and a half-dozen heifers, all of prize-winning strain. He bought them of Mr. O. Parry Jones, of Llechylchyd, Bryngrau, Anglesey. These animals have a great reputation, among those who know them, as general purpose cattle. They are excellent for dairying, the herd from which Mr. Edmonds selected his showing 20 cows producing 180 lbs. of butter a week. They mature early, are good breeders and hardy, and put on flesh fast when wanted to fatten. They are considered first-rate butcher stock in the midlands of England. These cattle are doing so well at Ripplemead that one cannot help feeling that there is a future of some interest before them in this country. Anyhow, Mr. Edmonds deserves credit for his enterprise.

THE RIPPLEMEAD STUD MERINOES.

So much has appeared from time to time in the *Agricultural Journal* descriptive of the founding and progress of the Ripplemead merino stud, that very little that is new is left to be said. All one can do now is to place on record the well-known fact that the flock is still thriving and more than maintains the high level to which it has attained. As is well known in all the sheep districts, Mr. Edmonds has endeavoured to establish a stud flock to suit the requirements of this Colony and with that end in view has carefully built up what might fairly be described as an Edmonds sheep. He started the flock in 1891, and considering the few years that have passed, he has accomplished a very valuable work. The foundation of the flock was pure Tasmanian blood crossed on Vermont ewes, and with slight variations this strain has been maintained to the present day. "Golden Horn," a pure Tasmanian ram, was the father of the flock. He was a son of Golden Horn II., and was awarded championships in his day. A son of his, "Golden Legend," was also a prize winner at Eastern shows and first in his class (six tooth) in 1889 at Port Elizabeth. Of the present representatives of the flock the ram "Enterprise" is an excellent animal, full of activity and health, fine symmetry, with a good carcase and frame, so it will be seen that the stamp of sheep now turned out at Ripplemead is more in keeping with the Colonial taste than the pure Vermont. What Mr. Edmonds has done is, by copying the most successful users of Vermont blood, to introduce and maintain the good points of that strain into his flock. The result is quite satisfactory, as was demonstrated at the shows held in the grass country last year, when the Edmonds exhibits were placed on top twice with most formidable competition. To achieve so much in so short a time is a record to be proud of, and Mr. Edmonds will do well to maintain the lines he has started on. The breeding of stud sheep is an art not mastered in a day. It calls for care, forethought, judgment, and, above all, the courage to reject with a merciless hand anything that does not reach the standard aimed at. Selection and rejection, quality not quantity, must be the guiding principles of the successful breeder.

I regret that I could not see more of the Stutterheim district on this trip, but hope to renew my acquaintance with the hospitable and enterprising farmers of that section on some future occasion when other places of interest can be visited, and when the conditions will have improved.



Young Ram, "Enterprise," property Mr R. Pell Edmonds, of Ripplemead

THE DESTRUCTION OF LOCUSTS.

SOME NOTES BY C. W. MALLY, M.SC., ACTING GOVERNMENT ENTOMOLOGIST, GRAHAMSTOWN.

The work of locust destruction in Cape Colony has been under the Government Entomologist only since November 1904. Nothing in the way of practical field work could be arranged for until the middle of December. By that time the "voetgangers" of the Brown Locust, (*Pachytylus sulcicollis* Stal.) were just beginning to transform to adults (winged stage) and fly away. Hence the time was too short for anything like extensive field tests. However, a few points were established which it is advisable to record at the present time so that they may be kept in mind in planning the work for the coming season. This seems like taking an early start, but one of the chief sources of failure is the fact that almost nothing is done in the way of preparation until the locusts begin to hatch. Then there comes a wave of nervous earnestness which brings an abundance of petitions and requests for aid of various kinds, and then gradually subsides till the next year, the chief result being a few good resolutions to be better prepared next season. The locust problem in Cape Colony has never been taken up in a thorough, systematic way,—the only possible way to attain success.

I shall not go into detail regarding the life-history of the locust, for nearly all have a fairly correct general idea. To settle doubtful points between the different species, and for each species, will require a great deal of careful research before a decisive answer can be given.

NATURAL ENEMIES.

The question of Natural Enemies is usually one of the first to be mentioned. Fortunately, locusts have many natural enemies. Were it not so, the country would be in a sad state. Disease, parasitic insects, birds and many of the larger animals play an important part in keeping the locusts within bounds. There is little that we can do to assist them, for they in turn have enemies and on the whole are governed by conditions over which we have no control. A good example of this is the well known Locust Fungus. Dr. Edington whom I consulted recently, has spared no effort to spread the fungus extensively in the locust-infested areas, and under favourable conditions good results were attained. But he agrees that beyond the mere fact of distribution nothing can be done because it entirely depends on natural conditions whether or not the fungus will develop satisfactorily. Unfortunately, under the conditions which usually prevail when locusts are abundant, the fungus practically lies dormant. The systematic destruction of the locusts through human agency may have a decided influence on the natural enemies because it reduces their numbers as well as their food-supply. When we destroy the locusts we also destroy the young stages of any internal parasite that may be at work. The large fly that is so often mentioned by farmers will suffer heavily in this way. It would be rather troublesome to isolate the captured locusts so as to allow for the escape of the parasites when they mature. Our verdict "for" or "against" the natural enemies must be based on the sum-total of their work. If that is satisfactory (as in the case of the "Vedalia" *vs.* the "Australian Bug") then leave the field to them. But the majority agree that we must interfere in our own behalf. If we can discover satisfactory artificial means of control we may practically disregard the natural enemies and leave them to cope with the locusts which escape artificial destruction. The question is: How can we accomplish the destruction of the locusts to the best advantage?

DESTRUCTION BY ARTIFICAL MEANS.

Collecting the Eggs. Under favourable circumstances much good may be done by digging up and destroying the eggs. The nature of the soil limits the usefulness of this method, for, although we may destroy large numbers of eggs many more are missed and others are in localities that are all but inaccessible. The eggs that are missed will hatch as soon as proper conditions prevail and necessitate other steps being taken. The labour involved in the destruction of the eggs is no small item.

Destroying the Voetgangers. The young or "voetganger" stage is the critical time in the life of the locust. When it has once passed that stage and developed wings it stands a good chance of accomplishing the remaining great purpose of its existence,—*reproduction.* The all but helpless, unprotected "voetganger" stage is our opportunity. If it is lost through neglect we must simply blame ourselves and await the recurrence of the plague. A swarm can be destroyed to best advantage at the time of hatching. After that the work becomes more difficult.

The most important artificial means of destruction are as follows:—1. Chemical agents,: (*a*) Spraying the surrounding vegetation with poisoned bait. (*b*) Spraying the locusts themselves with something that kills by contact. 2. Mechanical agents, *i.e.*, direct destruction by means of, (*a*) Flails, brush harrows, rollers, trampling with sheep &c.,—(*b*) Screens in connection with trenches, or traps of various kinds.

Poisoned Bait.—Poisoned bait has been extensively used in Natal with very satisfactory results. The solution is prepared according to the following formula, recommended by Mr. Claude Fuller, Natal Government Entomologist.

Arsenic	1 lb.
Washing Soda	½ lb.
Treacle or Sugar	5 lb.
Water	10 gallons.

The arsenic and soda are boiled together till dissolved and then diluted to 10 gallons and sweetened with the stated amount of sugar or treacle.

The arsenic kills the locust, but the treacle is necessary to tempt them to eat it. The bait should be sprayed over the vegetation surrounding the swarm or across their line of march. Late in the evening or early in the morning is the best time to spray, for the locusts are then clustered together and will have to cross the poisoned area when they begin trekking. This has the manifest advantage of not requiring such close work on the locusts themselves, but care must be taken to prevent stock feeding on the poisoned grass or bush. The solution dare not be used on valuable plants because it burns very severely.

Contact Poisons—Although the materials mentioned under this heading are not poisons in the ordinary sense, yet in so far as they destroy insect life they may be included in the general term. The expression "contact poisons" is used because it conveys a correct idea of the necessary condition to produce the desired effect. To be effectual it is absolutely necessary that the materials be brought into actual contact with the body of the locust. Death is really due to suffocation, the spiracles (breathing pores) becoming either sealed or paralyzed to such an extent that they no longer perform their proper function. Mineral oils, soap of different kinds and certain vegetable decoctions such as tobacco extract, quassia, etc., are the more common contact poisons. Thoroughness in the application must be insisted on, for every locust that is not covered with the spray will hop away in perfect safety as soon as the spraying ceases. If the solution is too dilute, only temporary inconvenience is the result.

A great many different preparations have been tried and recommended by different people. For a time there was a tendency to recognise all in regard to which distinctly favourable reports were received. As a result we now have a long list of "official locust washes." They have never been subjected to a rigid comparative test and hence any attempt to weed out the undesirable ones at present would be premature. Under such circumstances a thorough test under practical conditions is the most satisfactory way of bringing order out of chaos. With that end in view and to gain a more substantial basis for recommending definite work for the coming season, preliminary tests under uniform conditions were made at Whittlesea (near Queenstown) December 17th to 20th, 1904, the 4th and 5th stages of the Brown Locust (*Pachytylus sulcicollis*) being the subjects of experiment.

Gossage's National Blue-mottled Soap, Sunlight Soap, and Caustic Soda 98 per cent. each at the rate of 1lb. to 2½, 5, and 10 gallons of water respectively were tried in comparison with Little's, Lawe's and Laidlaw's dips, each at the rate of 1 gal. to 10 and 20 gallons of water respectively. Both brands of soap and the caustic soda gave almost perfect results using 1 lb. to 2½ gallons water. Weaker than that the caustic soda was distinctly unsatisfactory. Both soaps killed about 90 per cent. at the 1 lb. to 5 gallon strength, but weaker than that they were not satisfactory. The difference in favour of the stronger solution was not considered sufficient to warrant doubling the expense. Little's dip, 1 to 10, was not satisfactory, killing only about 70 per cent. The weaker strength was no use at all. Lawe's dip, 1 to 10, did almost perfect work, but 1 to 20 killed less than 90 per cent. Laidlaw's Tobacco dip was useless. The above soaps and dips were selected because they are most frequently mentioned and are fairly representative. Another series of tests was planned, including combinations of Little's Dip and Caustic Soda, but rain interfered with the work.

Many farmers lay great stress on the time of the day the spraying is done. Some say the soap spray (1lb to 5 gal.) was a failure if applied during the day, but successful if applied during the night. Others claim the reverse. Others claim that the locusts will recover after a while and clear out. The above tests were made during the day and the locusts in each test were isolated so that any tendency to revive could be carefully noted. In the tests designated as satisfactory there was no sign of recovery in 48 hours and all persons present agreed that the locusts were dead. In the unsatisfactory tests the locusts were quite helpless for a time, but the majority had recovered in about two hours and were doing their best to escape.

The great divergence in the results reported by farmers can be accounted for to some extent. It was the exception to find a man who was really certain of his weights and measures. At first, though, they felt sure that they were perfectly exact. Close inquiry as to details usually showed that the work was anything but exact, the quantities having been estimated rather than measured.

In regard to the Blue-mottled Soap it should be stated that there were two distinct brands on the market for a time. Some farmers said they had used "Gossage's Blue-mottled" and others the "National Blue-mottled." The merchants stated that the second brand was an American soap which they no longer stocked, for, compared to Gossage's it was "cheap and nasty." The relative amount of water in the soap used may also be an important item. If the soap has been in stock a long time it is apt to be dry and hence tend to make the solution too strong. If fresh, it will be heavier and hence tend to make the solution too weak. A little experience soon enables one to gauge the condition of the soap and make sufficient allowance one way or the other.

So far as the preliminary tests go, Gossage's National Blue-mottled soap 1lb. to 5 gallons water was not surpassed in effectiveness and is the cheapest. The great objection usually raised against the soap is the trouble of dissolving it. The liquid dips are always ready, but the difference in price is sufficient to favour the soap.

Where large swarms have to be dealt with, the question of dissolving the soap is a difficulty of some importance, but with proper equipment it can be greatly reduced. It is no more troublesome than poisoned bait.

One great drawback to spraying either with poisoned bait or soap is that the work must be done mainly at night when the locusts are clustered in the bushes.

The question of the equipment necessary for the spraying operations has aroused considerable discussion. The Government has issued a large number of "Success" pumps at different times. It is a splendid pump and not easily surpassed for work which comes within the limit of its capacity. For small swarms or when the locusts are just hatching it is very useful because it is so easily carried about. Some say the spray is too light. That suggests the possibility that the piston needs attention. It may be worn or improperly packed. The spray is then not only light but irregular and unsatisfactory generally. When the pump is in proper order there is little room for complaint as to the fineness or force of the spray.

In Natal, the knapsack pump has given every satisfaction for distributing the poisoned bait. It has the decided advantage that each boy is a working unit and can move about much more quickly in rough or bushy veld. But here again you must not expect the impossible. If given the choice between the Success or the Knapsack, I should certainly take the Knapsack. The difference in price is a consideration, but it should not outweigh the greater usefulness. No matter what pump is used, provision must be made for transporting the spraying solutions. A Scotch cart and a barrel holding 40 to 50 gallons may be sufficient. If not, a larger number must be secured, or else provision made for large tanks on waggons Once on the spot the Knapsacks can be filled and each boy set to work as seems best. The drawback to the Success pump is that it is awkward to shift about. The number of small pumps required depends entirely on the amount of work to be done. Each farmer should have at least one. They can then unite their efforts on the farms on which the locusts hatch.

For dealing with large swarms in fairly open veld, an ordinary barrel sprayer with two twenty foot leads of hose and extension rods would be an advantage The majority of the farmers would find it to their advantage to have a good barrel sprayer and a Knapsack pump at hand as part of the regular farm equipment. They could then choose whichever suited the conditions. The pumps would be available not only for locust destruction, but also for spraying the fruit trees and potatoes and for white-washing fences, buildings, &c.

In regard to the nozzle, I know of nothing better than the ordinary Vermorel or the Bordeaux nozzle. The coarser or "heavier" sprays, as from an ordinary "rose" are very wasteful and do not afford a corresponding advantage.

Mechanical Means, such as beating the locusts with flails made of heavy wire, or harrowing them with heaps of brush, or crushing them by means of rollers, or trampling them with sheep or goats, &c., may all come in to good advantage at times, but their scope is so limited that it must be left with the individual to decide whether or not he can make use of them.

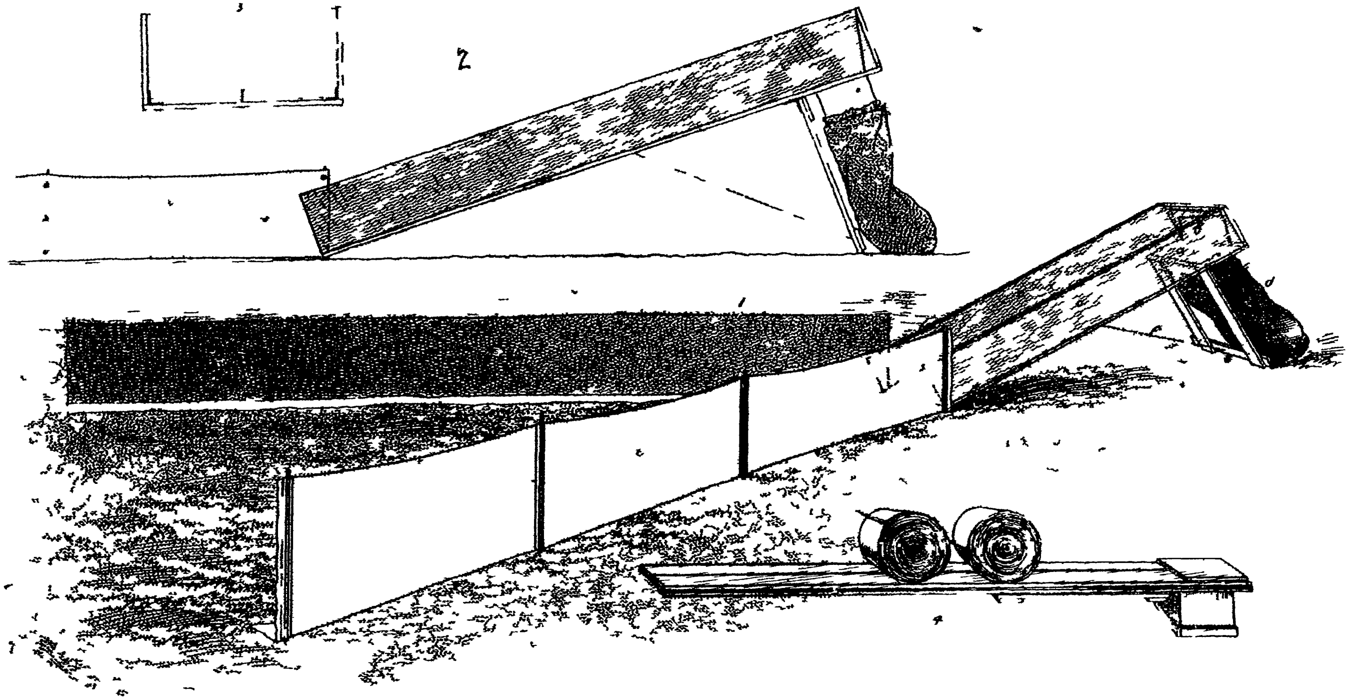
TRAPPING.

The habit of clustering together in bushes &c., for the night and then moving out in a definite line of march the next morning has long been recognised as the great weakness on the part of the voetgangers, and a great many ways have been thought of for taking advantage of it. The use of screens to turn the locusts toward a given point where a deep trench has been dug for them has been successfully followed in many places.

This is an easy and effectual way of *destroying* the locusts during the day. The *value* of locusts for poultry food suggested to the writer the advisability of adapting the trapping system so that the locusts could be killed and dried in place of being left to rot in the trench. They could of course be scooped out of the trench into bags, but this is extra trouble and a great many would probably escape unless the trench was first surrounded by a screen. It occurred to me that it would be much simpler to devise a trap in the form of an inclined plane by means of which the locusts would drop through a tin funnel into a bag. This would leave no chance for escape and there would be no trouble except to change the bags, the whole scheme working automatically. A trap similar to Plate I. Fig. 1., was accordingly arranged and successfully used in experimental trappings. It is simply a light frame of deal about two feet wide and nine feet long covered with hessian. One end was raised just enough to allow an ordinary grain bag to be placed in position. The supports should be drawn back slightly so as to allow bag to hang in a more nearly perpendicular position than shown in the illustration. This gives a slope of three feet in nine. A light framework 12 to 18 inches high (Plate I Fig. 1, c.c.c.) is hinged to the sides and upper end and covered with zinc, tin or American cloth. Being unable to jump over or climb up the sides the locusts move straight on and drop through the funnel (Plate I. Fig. 1, a.) into the bag as shown at d. The lid (Plate I Fig. 1, b.) is for closing the funnel while changing the bag, which can be done very quickly. The supports are secured by hinges so that the whole trap folds up compactly for transport. (See Plate I, Fig. 5) The screens (Plate I. Fig. 1, e.) are run out as usual for trenching, the angle depending on the nature of the ground and the swarms to be dealt with. Figure 2 (Plate I.) gives a side view and Figure 3 a sectional view of trap.

There is an important feature of the trap which does not appear in the figure. I have called it the "retainer." When the locusts are swarming into the trap some of them veer around so as to strike the screen at the wrong angle and start back towards the veld. When once started the followers gradually increase until there is a

PLATE I.



1 General view of Locust Trap in position a, Tin or Zinc Funnel through which Locusts drop into Bag, d b Lid for closing Funnel while changing Bag, t, Rope Stays for Supports, c, c, c, Movable Sides, e, e, Screens leading up to Trap 2 Side view of Trap 3 Sectional view of Incline 4. Trap folded for moving

genuine "stampede," which it is no easy matter to check. To avoid delay and loss, a narrower screen (12 inches high) can be thrown across between the two main screens, about 10 or 15 yards back, the smooth side towards the trap. To allow the advancing locusts to move on without interruption, a two yard width of hessian should be placed behind the retainer, one edge secured to the top of the iron stakes and the other drawn back tightly and fastened by means of small pegs. This gives an easy incline. Once within the retainer the locusts are constantly turned back and soon find their way into the bag without disturbing the "new comers."

Screens of calico 12 inches wide with a 3 inch strip of American cloth along the top were first tried. They were hardly high enough and it was difficult to adapt them to the irregularities in the surface of the ground so that the locusts could not get under them. They were sewn together and thin narrow strips of deal 18 inches long tacked across them every two yards to stiffen them. This gave a screen 18 inches high with a six inch skirting at the bottom. The screens were held in position by means of iron stakes 24 inches long cut from $\frac{7}{16}$ iron rods, passing through small wire loops, there being one stake every four yards. For the first 10 yards it is best to place a stake every two yards. In this form the screens easily lend themselves to irregularities in the surface or in passing clumps of bushes or other obstacles and san be quickly placed in position. The six inch skirting lies flat on the ground at right-angles to the screen and as the locusts hop on to it, their own weight presses it down close to the ground and makes escape very difficult. A decided objection to the calico was the tendency of the locusts to climb up till they came to the American cloth, where they would hang indefinitely trying to make their way across. They would crowd on to the screen until every available space was occupied, but they would not let go or move on. They had to be brushed off. They would then scramble away in every direction and many would climb back up the screen. As soon as they came to sheet-iron they could not climb up and hence kept moving on towards the trap. It therefore seemed best to have the whole screen of American cloth and only the skirting of calico. The initial expense is greater, but a great deal more can be accomplished with them. The question of wear must also be considered. Some fear the smooth surface will crack and break badly. Others think there will be little trouble from that source. A very light grade of zinc or tin was strongly urged by some as the best material to use for screens. It is no doubt the best way to provide permanent protection for valuable lands. I fear metal screens would not lend themselves readily to irregularities, especially when it is necessary to run the screens quickly across the path of a moving swarm An 18 inch screen was quite high enough for the voetgangers of the Brown Locust even near the trap where they were scrambling about in the utmost confusion. They cannot jump over and the trap seems like a chance to escape.

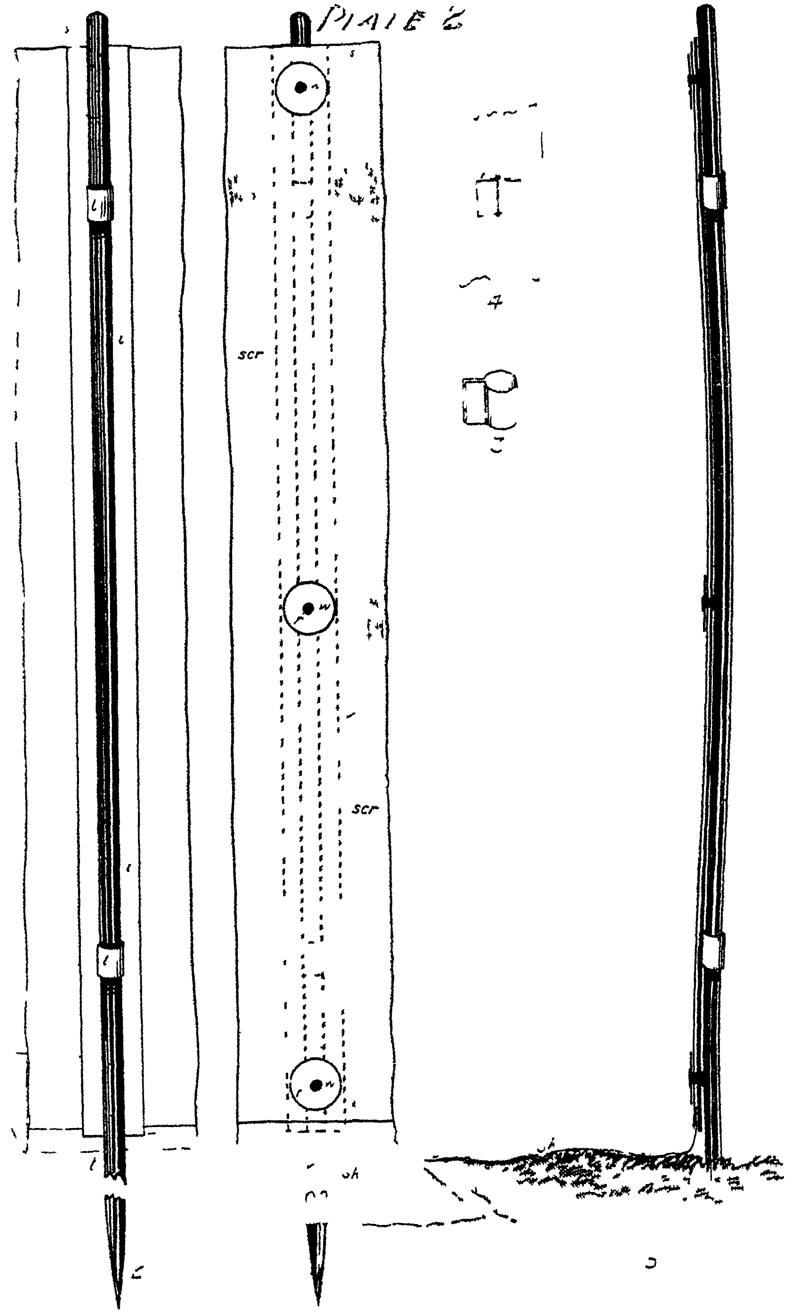
When the trap was once in position a great many improvements were suggested. The illustrations are presented herewith simply to give a clear idea of what is meant. Each farmer who takes any interest in the matter will no doubt make a trap to suit his own notions, and no doubt some of them will find a way to meet the requirements very nicely. Mr. van der Linde designed a large trap to take siz bags at a time. It would serve nicely for swarms that keep coming along steadily for days, but it is too heavy to be easily shifted from place to place. Portability should be preserved.

The method of tacking strips of deal across the screens was objectionable because the tacks easily pulled through the calico and the strips were easily broken and not strong enough to take the iron loops for the stakes. The deal strips have been replaced with one-inch strips of No. 20 galvanised sheet-iron perforated so as to take three soft rivets (one at either end and one in the middle) to pass through the screen and then rivet over a ¾ inch iron washer to prevent tearing in handling the screen. See Plate II. One strip every two yards is quite enough, and one stake every four yards (*i.e.*, every other strip) is sufficient to hold the screen in position. For the first ten yards from the trap one stake every two yards would be best. Nothing but the washer appears on the smooth side of the screen. Hence there is nothing for the locusts to cling to in their efforts to climb up.

When trapped the locusts can be easily killed by scalding with hot water. A less troublesome method could easily be arranged by means of a tight box with a closely fitting lid. A number of bags could be packed into it, the lid fastened and a small quantity of bisulphide of carbon (at the rate of 1lb. to 100 cubic feet) poured in through a funnel fitting into a hole which could be easily stopped. The only drawback is that it costs as much to kill one bag as it does to kill 10, provided the box holds that many. For dealing with the smaller swarms, it would be an advantage to have *killing bags* of water proof sheeting made just large enough to slip over a bag of locusts. The necessary amount of bisulphide of carbon could be poured in, the bag tied and left the required time. This would be a distinct saving in the amount of bisulphide. It is not the intention to take the killing box or bags into the field. They may be left at headquarters. The freshly trapped locusts can remain in the bags for a day or and be none the worse for drying. Since they must be brought home in any case they may just as well be taken alive. It is barely possible that if they were simply slipped into the killing bag, tied and left out in the hot sun they would very soon suffocate. The locusts that where trapped at Whittlesea were scalded with hot water and then placed on sheets of corrugated iron to dry in the sun. They were protected from dew over night and were turned several times during the day to prevent decomposition. On the afternoon of the third day they were perfectly dry and were packed into a case and shipped for experimental purposes. They have been kept in bulk about two months and are in perfect condition. They are very brittle and can be easily crushed into meal.

The trapping method has the advantage of saving the expense of soap washes or poisoned bait and in addition will certainly yield

Plate 6



1. Section of Screen, *scr*, with Skirting, *sk*, shewn; Rivets, *r*, *r*, *r*, and Iron Washers, *w*, *w*, *w*, for securing Iron Strips to back of Screen. 2. Reverse side of 1., to shew Iron Strip, *i*, Loop, *l*, and Iron Stake, *s*, for holding Screen in position. 3. Side view of Loop (fig. 2, *l*) for holding Stake. 4. Reverse of section of Iron Strip (fig. 2, *i*) to shew attachment of Loop. 5. End view of Screen to shew position of Skirting, *sk*.

the interest on the money invested including cost of outfit and labour. The trap is less expensive and much more adaptive than the trench system, and besides has the advantage of portability, for two boys can easily move it from place to place to meet an oncoming swarm. It can be put into position quickly and in situations where the digging of a trench would be out of the question. It is very easy to take the screens during the evening or early morning and quickly enclose the different "camps" of a big swarm. As soon as the swarm begin moving, the trap can be shifted fron one *locust kraal* to the other in succession until the lot has been bagged. This greatly relieves the night work, for, when once enclosed, they cannot get away.

Value of Locusts as Stock Food.

When the locusts have once attained the 4th and 5th stage of development they are too valuable to be simply killed and allowed to rot on the veld, especially since they can be easily trapped, killed and dried. It is no uncommon thing to hear the remark "everything eats locusts". The natives are very fond of them and fare very well indeed even in times when there is little else for them to eat. Ostriches and poultry do wonderfully well on them. Horses, sheep and pigs are also fond of them. No one doubts the value of locusts as stock food. Just what rank they should have among the different feeding-stuffs can best be determined by chemical analysis, together with experimental feeding. A supply has been handed to the Government Analyst, Mr. J. Muller, Graham's Town, and his report will be awaited with interest.

The question of a market for the dried locusts naturally suggests itself. Several ostrich farmers told me they would be glad to buy quantities of dried locusts to feed their birds after the locusts have disappeared. There will no doubt be sufficient demand in the market, but the difficulty will be to supply it. It is my opinion that when the farmers once realize the value of the dried locusts they will prefer to turn them into money by feeding them to their own stock.

It is claimed that the influence of the locust-diet is very noticeable in the eggs of fowls. On one occasion I noticed an egg the yolk of which was rather large and of a decidedly red colour. The party to whom the egg was served revealed no signs of anything unusual in the flavour. By mere chance I mentioned the fact in the presence of farmers who had every opportunity of knowing and they said at once that they always noticed that change in the eggs after the fowls had been feeding heavily on locusts for a time. They were not so sure about the influence on the flavour of the eggs. If the above statements are found to be correct under conditions of proper feeding, it will be a serious objection. On the other hand it would not be surprising to find that the locust diet has a direct influence on the vitality of the chicks. If this proves to be correct, then the locusts will be of special value to the ostrich farmer and the poultryman at the beginning of the breeding season.

PROTECTING VALUABLE LANDS FROM VOETGANGERS.

One way to protect the lands is to supply all hands with flags and drive the locusts on to the neighbour's farm! It is an utterly selfish thing to do and deserves the severest condemnation. The utter folly of it is evident when one considers the fact that the same force of boys could easily destroy the locusts and prevent the possibility of a second visitation by the same locusts a few days later.

The voetgangers can be easily excluded from valuable lands by means of a "permanent barrier," or, to use a more expressive term, a *locust fence.* A cheap grade of zinc, tin, or sheet-iron about 18 inches in width and secured in a vertical position would serve every purpose. If this could be done for the whole farm it would be a wonderful advantage, for it would make each farmer independent of his neighbour. If he then destroyed his own locusts his crop would be safe, barring the possibility of a flying swarm settling down. Fencing the whole farm is out of the question on account of the initial expense. But to enclose valuable lands with a locust fence is a splendid business proposition. In every case of serious loss that came under my notice, the expense would have been much more than repaid in the present season. As matters now stand there is neither fence nor crop to show for the time and money spent on the land. The members of the Whittlesea Farmers' Association were keen advocates of it as the result of their efforts last November and December, and I am pleased to note in the February, 1905, *Agricultural Journal,* that "Interested" has put his ideas into tangible form and urges the value of the locust fence from the standpoint of the practical man. It is not a *new* idea, for I have at different times seen it tried with more or less success. It is simply a question of getting the idea into practical shape so that it can be brought into general use. So far as one is justified in judging from experimental tests, I believe that point has been reached. But it remains for a practical test to give the final verdict.

If the lands are already enclosed by a fence of some kind, there may not be much difficulty in placing the locust fence in position. Few lands are specially fenced off. Hence it is necessary to devise some way to make the locust fence literally "*stand on its own merits.*" The fact that the materials will be required in quantity makes it feasible to have them prepared in convenient form to meet the requirements. Inquiries with this end in view are in progress. It seems the most practical way to have the zinc or tin in 25 or 50 yard lengths and rolled on a light reel. This avoids securing so many joints and still keeps the units down to convenient size and in convenient form. Eighteen inches in height is sufficient and allows for sinking into the ground two or three inches. Greater irregularities than that must be filled in. The simplest way of securing the fence in position is by means of iron stakes 24 to 30 inches in length, depending on the soil.

The zinc or tin is fastened in a vertical position by means of two small loops of the same material passing around the stake. The ends are passed through a slit near the top and the bottom of the zinc and secured by simply turning one either way and pressing them flat. (See Plate II, figs, 2, 3, 4). This method was first devised with a view to placing the trapping screens quickly into position. It will serve equally well for holding the locust fence in position and retains its advantage in being quickly put down and easily removed at the close of the danger period. It is simply offered as a suggestion. Each farmer will probably find a way of his own to accomplish the same purpose.

It may be objected that this does not protect against the flying swarms. But if we successfully cope with the voetgangers there will be no flying swarms, barring invasions from distant parts.

DIFFICULTIES.

Scouting, water supply and transportation are elements in the work which deserve special consideration. The necessary scouts to locate the hatching swarms is of primary importance. When we consider the vast expanses of veld that are not traversed by a human being for weeks and even months at a time, it seems out of the question to think of catching all of the swarm as soon as they hatch. Few farmers can spare the necessary boys or women to scout their own farm properly, because the locusts usually hatch at a critical time for the usual farm work. I do not favour the suggestion, made by a correspondent in the *Agricultural Journal,* that we should let everything else go for a month or six weeks and devote all our energy to locust destruction. In many instances the neglect of farm operations for that length of time would virtually mean failure for the rest of the year. The regular farm work is fundamental and we must find a way of dealing with the locusts without interfering with it. Otherwise the whole problem degenerates into a choice between two evils. It means one of two things, either increase the labour supply or else reduce the farm operations to par with the available labour, with a view to doing good—rather than extensive—work. After the work of locust destruction is thoroughly organized and we know more nearly where the eggs were deposited this phase of the problem will be much easier. But for the present, we must count on destroying as many of the newly hatched swarms as we can find and deal with the older voetgangers as they come on.

In many instances, even on the smaller farms, the question of water and transportation is no small item. During the drought this season many farmers were much more worried about water than they were about the locusts. In other cases there was not the necessary transport and equipment to take the water for miles into the veld.

The size and formation of the swarm is also important. The usual description of a moving swarm gives the impression of a rather narrow column going in a definite direction. Such swarms are not difficult to master. At Fish River Station the last week in November 1904, one part of the veld was alive with the hopping locusts. They were trekking directly across the main road from Fish River Station to Cradock.

Through the kindness of Mr. H. T. Collett, I was enabled to ride across their line of march with a view to gaining some idea of the width of the swarm. We had covered about a mile and a half when we met some young men on horseback. They had been riding through locusts for several miles. Some native boys coming from Cradock said they had been tramping through locusts all the way for about 20 miles. How reliable the information was I cannot say, but I noticed nothing to indicate that the men were simply telling tales for their own amusement. The above notes not only give some idea of the area covered by what might be called a swarm, but they show the practical difficulties of dealing with this case in compliance with compulsory legislation. To think of spraying them meant carting the water for miles over a rough stony veld, after the locusts began clustering for the night. The digging of pits or trenches for catching them was out of the question on account of the nature of the soil. To use poisoned bait meant spraying a strip across the whole veld, for there were two or three locusts to the square yard. The only way at all feasible would have been to have long stretches of screens with traps and bags at convenient distances Even this would take some doing.

Religious sentiment is an important consideration in certain sections of the Colony, for it is believed that the locust plague is a Divine infliction with a view to calling them to repentance, and that any effort to destroy the locusts would be an attempt to thwart the Divine Will. While there is no desire to make light of honest conviction in the matter, there can be no harm in asking whether or not that view of the case is really correct. Many other things which inflict serious material loss are destroyed without hesitation. Why make an exception of the locust? On the other hand, as pointed out above, the locusts can be made to serve a very good purpose and hence we may justly consider that they are a blessing rather than a punishment, and that we are guilty of neglect if we fail to make proper use of them.

Co-operation is the cry everywhere, but there seems to be little inclination to co-operate when the actual work has to be done. This is not to be wondered at because there is neither division of labour nor a definite method of procedure.

LEGISLATION.

A great deal has been said about a "Compulsory Act" making it the imperative duty of each farmer to destroy the locusts that hatch on or cross his farm. It seems very simple at first thought, but in practice I think it will prove to be a big machine and require a great deal of attention. I believe it can be managed if a strong measure is passed and then carried out unflinchingly. Half-hearted effort is of little use. Some believe it best to start in an experimental way in certain sections, gradually including the whole of the locust area as soon as may seem advisable. Any act should be framed with due regard to the practical difficulties that will have to be overcome.

CONCLUSIONS.

1. No one method will enable us to control the situation. An intelligent combination of the different methods systematically carried out is most likely to give satisfactory results.

2. The newly hatched swarms should be destroyed by spraying (*a*) their food-supply with poisoned bait, or (*b*) the locusts themselves with Gossage's National Blue Mottled soap, 1 lb. to 5 gallons of water.

3. The lands should be protected by means of a locust fence.

4. The swarms of trekking locusts should be trapped and dried for poultry and stock food. They are thus not only prevented from coming to maturity and laying eggs for the next season but are made to yield a substantial return for their damage to the veld and the time and money invested in destroying them.

5. Natural enemies (especially birds) are already doing their best and should be protected whenever possible.

The above suggestions are submitted in the hope that they will lead to more definite work during the coming season, if locusts are abundant. No one is more keenly alive to their shortcomings than the writer. I believe a locust campaign that will have a far-reaching effect on the agriculture of the Colony can be arranged and carried out.

ACKNOWLEDGEMENTS.

It affords me great pleasure to acknowledge the hearty co-operation of Mr. Hewett, Resident Magistrate, Queenstown. He has from the first taken a keen interest in the work of locust destruction and has spared no effort to assist the farmers to cope with the task before them. It was on his suggestion, in consultation with a number of farmers from Whittlesea, that the spraying and trapping experiments were conducted at that place.

Great credit is also due the Chairman, the Secretary and the Members of the Whittlesea Farmer's Association. They did everything in their power to further the work and appointed Mr. Mattushek to assist me in the work. He co-operated very ably and faithfully. The killing and drying of the trapped locusts was successfully carried out by him.

Mr. William Butler, Sen., and Mr. Butler, Jun., rendered valuable aid at all times, especially in equipment and tools, and made it possible to carry on certain phases of the work.

Mr. van der Linde, and many others, took a keen interest in the work. He designed a large locust trap of which we may hear more in the future.

To one and all I express my appreciation of their kindness and co-operation.

THE HOUSING OF MILK COWS.

Interesting Experiments.

Mr. E. F. Cockbain of East London writes:—I am sending you herewith what is I consider the report of a very interesting experiment relative to milk yields of stalled and unstalled cows during the early months of winter. I first saw a reference to this in the summer number of the *Live Stock Journal,* and, being interested, wrote to the Principal of the Harper-Adams College, where the experiment was conducted, for further details, and am to-day in receipt of his courteous reply. Although not fully applicable to South African conditions of climate, etc., still I cannot doubt that this information would form interesting and also possibly useful to many dairy farmers out here, and if you think so too, some details of the trials may strike you as worthy of notice in the pages of your interesting *Journal.*

The following is the correspondence and the particulars mentioned:—

The Principal,
Harper-Adams College,
Newport, Shropshire.

DEAR SIR,

In the Summer number of the *Live Stock Jonrnal* I read with great interest an article by Mr. Jas. Long relative to some trials conducted under your supervision as to the relative milk returns from stall fed and naturally fed cows during the earlier winter months, resulting in returns surprising to most people I think. Both myself and a number of farmer friends out here have been much interested in the trial and although the practice does not apply to the same extent in this country as at home, still I should for their information be glad if you will answer the following questions on the subject which are hardly clear in the article referred to.

(*a*) Were the cows turned out left in the open all night?
(*b*) If housed at night did they receive any hay or other food?
(*c*) What food besides hay did the stalled cows receive, if any?
(*d*) Were the stalled cows able to obtain water at all times?

(*e*) Was the experiment continued in any case after December and if so what were the results during the early months of the year?

(*f*) What breed of cattle were used for the experiments?

Please accept my apologies for thus troubling you, which I would not do but that I am much interested in such matters, which you will, I trust, take as an excuse for this letter.—Yours &c.

E. F. COCKBAIN.

Harper-Adams Agricultural College,
Newport Salop.
November 7th, 1904.

E. F. COCKBAIN, ESQ.,

DEAR SIR,

In reply to you letter of October 15th which has just reached me, I am very pleased to give you any information upon our experimental work, and I send you printed particulars of the experiments which will answer your questions. I may supplement these by saying that the experiment was not continued after December 13th, but that we are this season intending to carry it on for a much longer period. Our climate here is pretty severe during October as a rule and we get extremes of weather.

In 1903 our rainfall in October was over 4 in. and in 1904 the rainfall did not exceed ·5 in.

The breed of cows kept for the purpose of experiments was Shorthorns, the cows were turned out in the open fields without any shelter whatever.—Yours &c.

P. HEDWORTH FOULKES,
Principal.

EXPERIMENT ON THE HOUSING OF MILK COWS IN AUTUMN.

The following experiment was started in the Autumn of 1901, and has been continued each Autumn since.

The regular practice in Shropshire, is to bring all milk cows into the house at night about the end of October, a proceeding which of necessity entails extra labour in attendance, and also extra feeding in the shape of hay in the racks and extra straw for bedding at night.

The object of the experiment is to ascertain the advantage or otherwise of bringing milk cows in at night during the Autumn.

Two lots of cows, five in each lot, were selected as closely alike in all respects as it were possible to select animals. Special care being taken that each lot corresponded as to date of calving, length of time in milk, and weight of beast.

The two lots of cows, were treated in exactly the same manner, with the sole exception, that one lot was kept in at night after milking and not turned out until after milking the following morning. This lot of cows received about 8 lbs. of hay in the racks last thing at night.

The second lot were milked, and then turned on to the same pasture and brought up for milking the following morning.

Milking was commenced at 6.30 a.m. and 4 p.m.

In 1901 the experiment was started on November 2nd ,and ended on December 7th, when all animals were kept in at night.

In 1902 the experiment commenced on November 22nd, and ended on December 13th.

In 1903 the experiment commenced on October 31st, and ended on November 28th.

Each year the climatic conditions showed extremes during the time of the experiment; *e.g.*, in 1903, the rainfall for November was 2·41 inches whereas the mean minimum temperature was 35F., and on 13 nights freezing point was reached, the lowest amount registered being 12 degrees of frost on November 19th.

The animals were weighed at the commencement, and at the end of the experiment.

All the cows in the experiment were due to calve in the Spring, and there was, therefore, a natural decline in the milk secretion.

The following table gives the result of the experiments for each year.

	Average yield per animal for four weeks previous to experiment.		Average yield per animal during time of experiment.		Decrease in milk per head per week. lbs.	Increase in Butter fat per cent.	Increase in live weight per head per week. lbs.
	Weight of Milk. lbs.	Per Cent., Butter fat.	Weight of Milk. lbs.	Per cent. Butter fat.			
1901.			5 weeks				
Cows out ..	640	3·78	624	4·55	3·2	.77	6·0
Cows in ..	677	3·51	619	3·84	11·6	·31	1·5
1902.			4 weeks				
Cows out ..	455	3 9	401	4·2	13·6	·3	10·9
Cows in ..	510	3·8	405	4·3	26·4	·4	2·9
1903.			5 weeks				
Cows out ..	620	3·63	662	4·1	23	·52	8·0 loss
Cows in ..	563	3·85	595	4·3	23	·49	8·0 loss

Columns I. and II. show the average yield and quality of milk of the animals when all were treated alike.

Columns III. and IV. show the average yield and quality of milk during the time of the experiment, between the dates already mentioned.

Columns V. and VI. show the decrease of milk and increase in quality of the milk during the time of the experiment.

Column VII. gives the increase in weight of carcase during the weeks of the experiment.

The figures should be taken for each year separately, and not one year against another, as the conditions of the experiment, like animals, weather, pasture and feeding, vary from year to year.

The results of the experiment are quite contrary to the ordinarily accepted facts. So striking were the results in the first year that it was decided to very carefully repeat the experiment before publishing any results. The results of the two succeeding years undoubtedly bear out the first results.

It will be seen that the effect of keeping the cows in at night is to decrease the milk yield at a greater rate than by leaving them out on the pastures. The effect on quality, as shown by the percentage of butter fat in the milk, is practically the same; in the first year of the experiment, however, there was a decided gain in favour of animals being turned out at night.

The increase in live weight in these animals shows that they do not suffer by being turned out night.

The extra cost of the keeping of the cows in at night would be:

	s.	d.
½ cwt. Hay (consuming value) ...	1	0
18 lbs. straw " "	0	3
Attendance (extra)		
Cost per head per week	1	3

The animals turned out would of course consume more grass on the pastures, but upon this it is impossible to place a value.

THE SALT BUSHES.

By Dr. E. A. Nobbs, Agricultural Assistant.

Frequent enquiries are addressed to the Department for seed of, or for information concering, salt bush; it has therefore been thought advisable to bring together the information we have on the subject and to explain how and where seed may be obtained.

The Australian salt-bush was introduced into the Colony at the advice of the eminent economic botanist Sir Ferdinand von Mueller in 1889, Professor MacOwan and Mr. Alston of Van Wyk's Vlei acting sponsors to it. To their painstaking efforts the Colony owes the possession of a forage plant of the greatest value, able to grow in our most arid regions, capable of withstanding drought in a remarkable manner, and thriving upon land too brak to permit the growth of ordinary bushes or grass. It therefore does not occupy land to the exclusion of the natural herbage though it grows along with our own vaal-boschje, tontelbosch, ink boschje, zout ganna and the rest.

The Australian salt bushes possess a more vigorous growth and seed more freely than our own. Characteristically very tenacious of life, these salt bushes once well established require but little care beyond being occasionally protected so as to permit them to flower and re-sow themselves. Valuable grazing at any time, they have been found specially useful in Australia during prolonged drought. All classes of stock not only graze, but fatten on it, and it is claimed to be an effectual cure for that prevalent trouble fluke. It is satisfactory to be able to recommend this plant for cultivation on brak soils in Cape Colony not only from accounts of its use in Australia and in California where it has been successfully introduced, but also on account of the good results it has given all over this country. It has proved itself of the highest value in many widely separated places so that there can be no doubt as to its appropriateness to our conditions. It now only remains to render it more widely known and to give farmers some opportunity of trying different varieties in order that they may realise its value and ascertain what varieties suit different localities best. Different kinds are recommended for sowing, the difficulties to be overcome being the prevention of the light seeds from blowing away and the protection of the young plants from the too assiduous attentions of stock. Once established all that is necessary is an occasional rest to enable the salt bush to come into seed.

To introduce salt-bush on to a piece of brak land a good plan is to loosen the soil with a spade or hoe in patches some little distance apart. Some advise a patch every 6 to 8 feet others say every ten yards, but in the latter case the plants must be allowed to flower so as to spread seed all round. Six to twelve seeds are dropped on each prepared patch and covered to a depth of ¼ to ½ an inch. A thorny bush is then placed over the seed so as to shelter the young plants until the stalks become woody and hard. The quantity of seed required will obviously vary with the distance apart of the patches, but as about 20,000 seeds go to the pound weight, very little is needed. 10 seeds every 2 yards, which is a generous allowance, means only about 1¼ lbs per morgen while at 10 yards apart this is reduced to about ½ a lb per morgen. It is said that if the seed does not get water within 5 or 6 days of being sown it dies, but there seems to be some doubt on the point. One or two wettings whether from rain or by flooding are sufficient to ensure its growth.

Another successful plan is to sow the seed broadcast over the veld *during* rain and then drive a flock of small stock back and forward to tread it in. Much more seed, say 8 to 10 lbs per morgen, will be necessary for this method and stock must be kept off the area for some months after, as thorn bushes cannot be used to protect the young plants as in the system first detailed.

Land which has been under cultivation, but has become brak may with advantage be sown with salt bush. The land may be ploughed and the seed dibbled in, or a furrow may simply be drawn every few yards and the seed sown in the loosened ground and covered with a second furrow. It will spread naturally very fast on tilled ground.

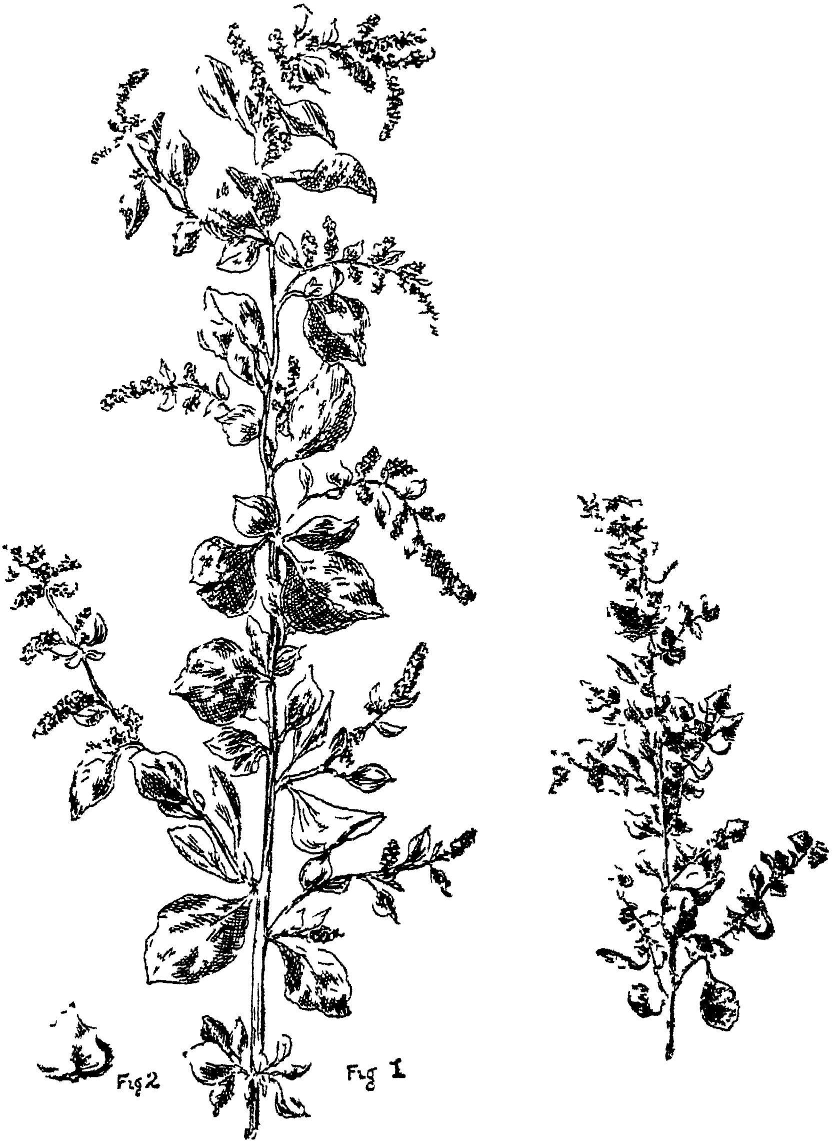
If any difficulty be found in getting salt-bush to grow from seed then it can readily be propagated from cuttings buried some eight inches in the soil, this is however a slow and somewhat laborious method.

Salt bush seed may be sown at any time of the year when the soil is moist except during the winter, and so far no particular season has been found to be best.

All salt bushes prefer moist brackish land, but are able to accomodate themselves to a great variety of conditions. There are, several kinds deserving special mention. *Atriplex nummularia* Lind., the "Alston's salt bush" of the Cape farmer, or the "old man salt-bush" as it is called in Australia was the original kind grown in this colony and is to-day the sort most commonly met. It is not merely a stand-by in time of drought, but a valuable forage plant possessing great fattening qualities.

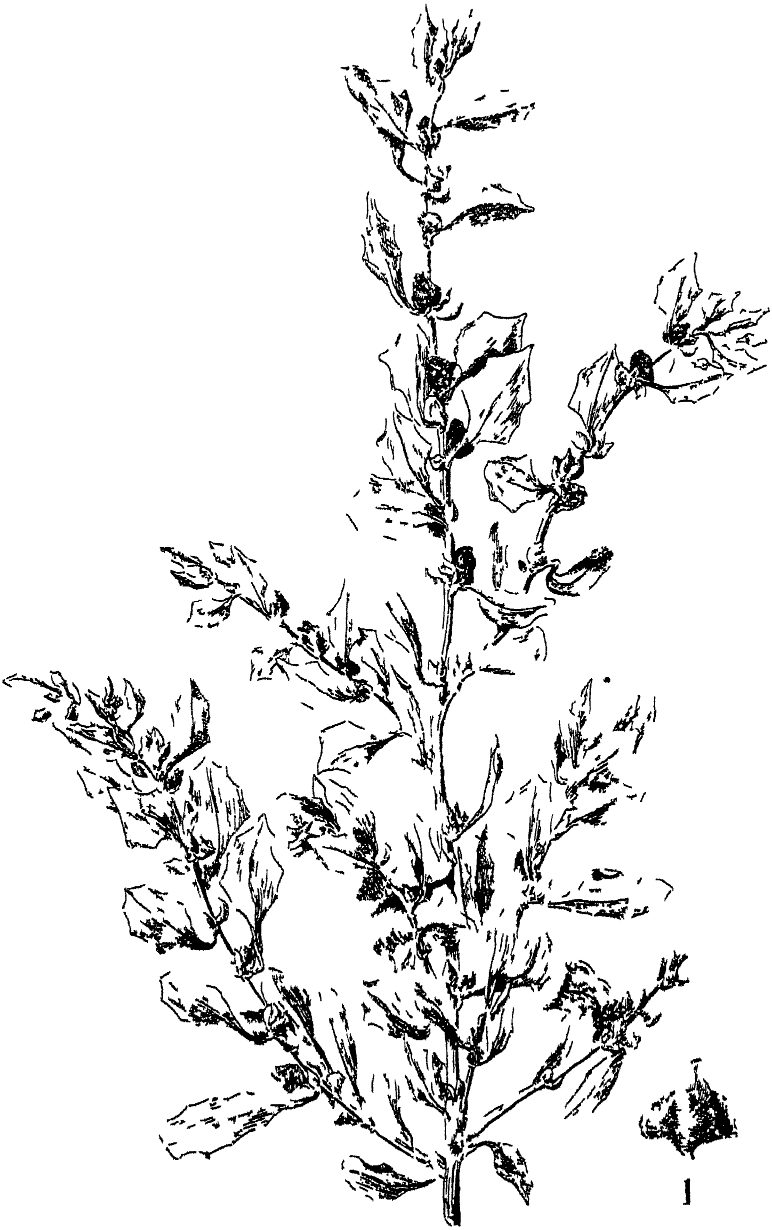
It is perennial, stands drought to a remarkable degree, and grows on very brak spots; it is said however not to withstand severe cold so well as some others. Imported New South Wales seed is obtainable through the Department of Agriculture, Cape Town at 1/9 per lb (one half the cost of importation) while colonial grown seed may be had from Mr. Alston of Van Wyk's Vlei, Carnarvon at the following rates. 5 lb bags post free 6/-per bag, or 25 lb bags free on rail, Hutchinson Station 12/- per bag, payable in advance.

Atriplex halimoides, Lind, the grey salt-bush, may also be obtained at the above price from the Department of Agriculture. This is a low bush creeping along the ground, perennial and drought-



ATRIPLEX NUMMULARIA, LINDL.
("ROUND-LEAVED SALT BUSH.")
Fig. 1.—The Male Plant. Fig. 2.—Section of the Fruiting Perianth.
The main Plant shown is the Female.

From Turner's "Forage Plants of Australia."

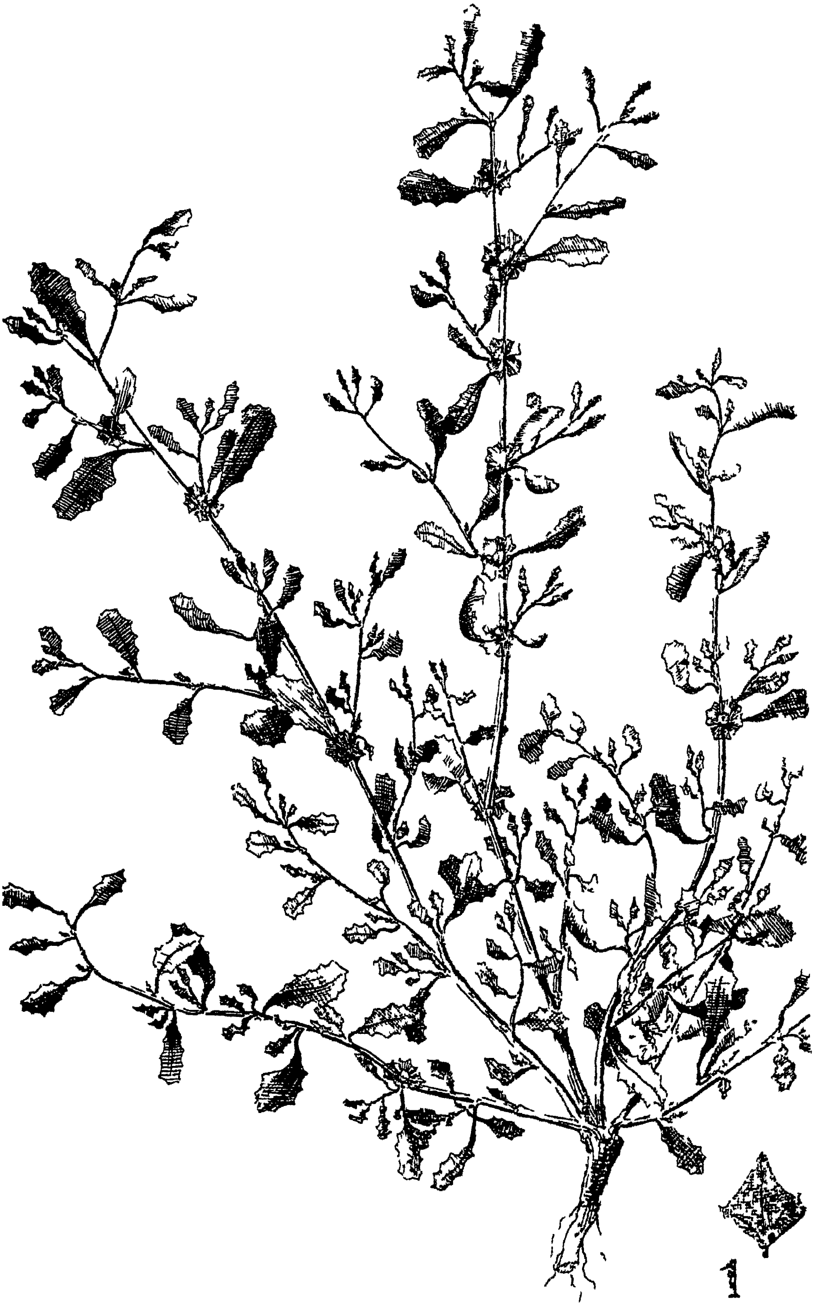


ATRIPLEX HALIMOIDES, LINDL.

HALIMUS-LIKE SALT BUSH.

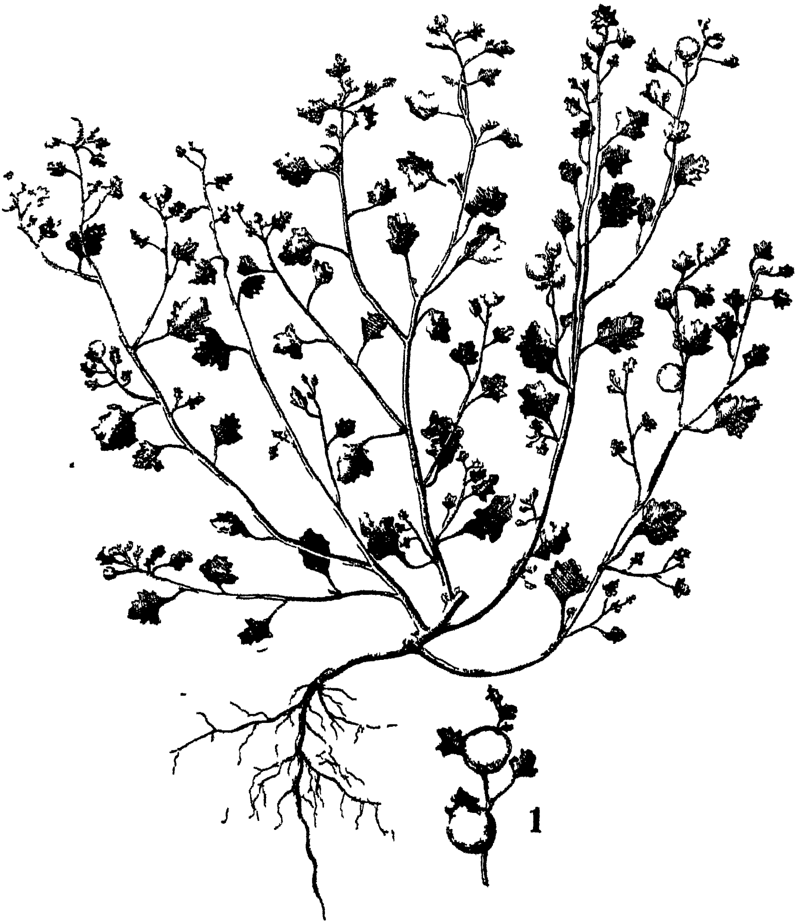
Fig. 1. Fruiting Perianth.

From Turner's "Forage Plants of Australia."



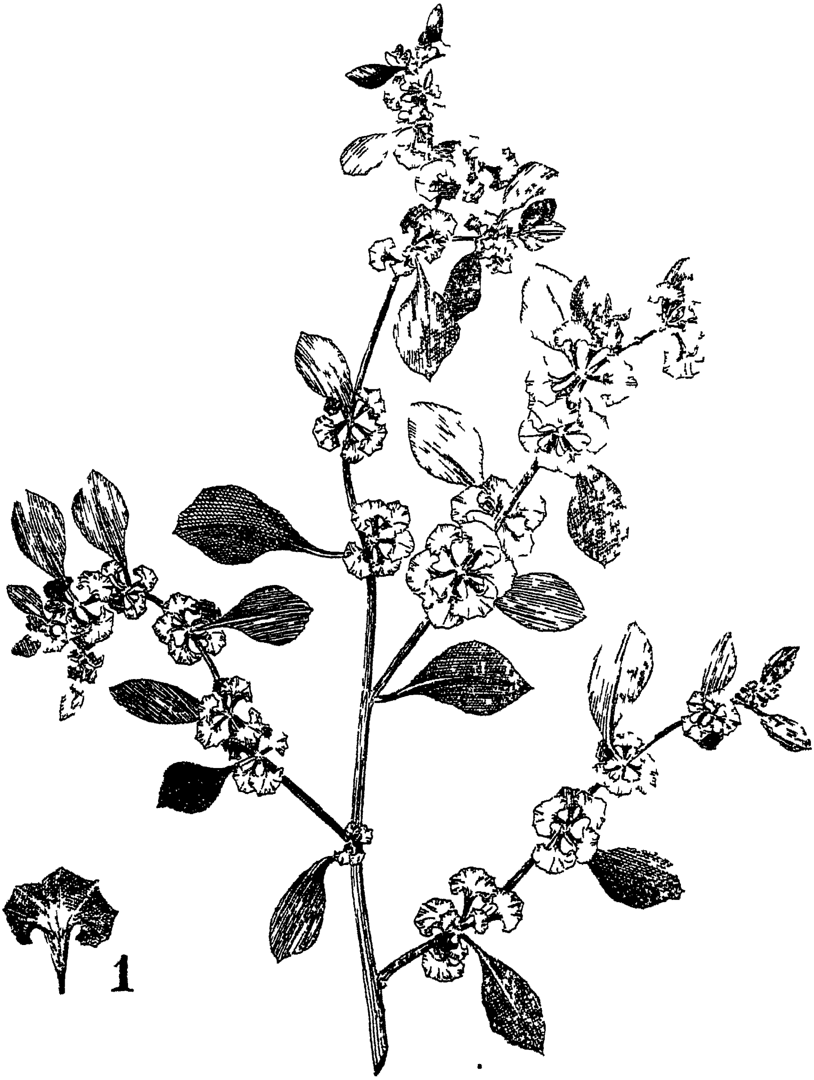
ATRIPLEX SEMIBACCATA R Br
"HALF BERRIED SALT BUSH"
Fig 1 – Fruiting Perianth

From Turner's Forage Plants of Australia



ATRIPLEX HOLOCARPA, F. v. M.
"All-fruited Salt-bush."

From Turner's Forage Plants of Australia.



Atriplex angulata, Benth.
'Angular-fruited Salt Bush.'

From Turner's 'Forage Plants of Australia.'

withstanding. Besides furnishing excellent feed it is claimed to be a preventive of liver-fluke so common a disease of sheep. It is recommended to sow this kind in the spring-time.

The following three varieties of saltbush are being distributed in quantities of about 1 lb free by the Department to such farmers as are willing to make a trial of them and to report what success they have with them. Applications for supplies are invited and should be addressed to the Agricultural Assistant.

Atriplex semibaccata, R. Br. the half-berried salt-bush, is widely distributed through Australia and has been extensively introduced with conspicuous success in California and the saline portions of the Western United States. Its habit of growth is prostrate and branching, forming a dense mat on the surface of soils too alkaline to support any other form of vegetation. It is recommended to sow it in springtime and, though a perennial, in districts where the winter is severe it should be treated as an annual, that is, the seed must be collected and sown out next season.

Atriplex holocarpa, F. v. M. described sometimes as annual, sometimes as perennial, dependant presumably on the winter temperature, is highly recommended, especially for land liable to be flooded. It is one of the creeping forms rising only 12 to 15 inches off the ground.

Atriplex angulata, Benth. a bush about 2 feet high comes from the arid interior of the Australian continent and even there it is somewhat scarce, but is said to be extremely drought-resistant even for a salt-bush, and is specially recommended for the drier plants of the Colony. Like all the rest however it requires a good wetting to start it and careful protection until it has finally established itself.

EXTRA TROPICAL FORESTS.

ERRATA.—In the above article in No. 1, Vol. XXVI. (January issue), the following corrections were omitted —

Page 18 for "Leucodendron" read "Leucadendron."
Page 23 for "this" read "the"
Page 24 for "150" read "137."
Page 25 for "this" read "the."
Page 29 for "treated" read "tested"
Page 29 for "3 per cent." read "3½ per cent."
Page 29 for "50" for nearly "43"
Page 29 6th line from bottom before "Cape" insert "useful."
Page 29 for "more than" read "nearly as much as."
Page 30 7th line from bottom for "16½" read "fourteen and one-third"

And in No. 2, Vol. XXVI. (February), the following corrections were omitted :—

Page 172 11th line from bottom for "to" read "for."
Page 172 11th line from bottom delete from "since" to "years" in line 10.
Page 173 add footnote "The accompanying two illustrations show a private forest at Knysna and a State forest at Tokai"
Page 179 3rd line from bottom for "naturally" read "natural."
Page 181 10th line from bottom for "products" read "produce."

CAPE TOWN INDUSTRIAL EXHIBITION.

GOVERNMENT PRIZES.

(*Continued from page* 232)

LEATHER.

(Judges. Lieut.-Col. H. Woodhead. C. R. Davison, Geo. Jopp.)

Sole, Upper, Harness, Hosepipe and Belting Leather, and Driving Belts.—There were no exhibits entered.

Boots and Shoes. Colonial made of Colonial Leather.—The Judges inspected a small exhibit from the Salesian Institute, which they report is very good—the workmanship is excellent and the whole exhibit reflects very great credit on the institution. Owing to the lack of competition, however, they cannot recommend that any prize be awarded.

Harness.—Best Set Pair-horse Carriage Harness, South African Leather. 1st prize, £5, James Sanderson.

Best Set pair-horse Carriage Harnees, Imported Leather. 1st prize, £5, Jas. Sanderson; 2nd prize, £1 10s., A. T. Rutter.

Best Set pair-horse Cart Harness, South African Leather. 1st prize, £5, Jas. Sanderson.

Best Set pair-horse Cart Harness, Imported Leather. 1st prize, £5, A. T. Rutter; 2nd prize, £1 10s., Jas. Sanderson.

Best Set pair-horse Cart Harness, "Gebraaide" Leather. 1st prize, £3, A. T. Rutter; 2nd prize, £1 10s., Jas. Sanderson.

Best Scotch Cart Harness, South African Leather. 1st prize, £3, Jas. Sanderson.

Best Set pair-mule Harness, South African Leather. 1st prize, £3, Jas. Sanderson; 2nd prize, £1, A. T. Rutter.

Best Set 8-mule Harness, South African Leather. 1st prize, £3, Jas. Sanderson.

Best Gentleman's Saddle. 1st prize, £3, A. T. Rutter; 2nd prize, £1, Jas. Sanderson.

Best Lady's Saddle. 1st prize, £3, A. T. Rutter: 2nd prize, £1, Jas. Sanderson.

We regret that the competition was so limited, but have pleasure in reporting that we were very pleased with the exhibits which were of a very serviceable nature, well made and finished, and we think reflect great credit on the manufacturers. The harness practically covered every variety of style of use in South Africa, from gentleman's best carriage harness to mule harness for heavy work. The saddles were limited in variety, but were well made of good leather and serviceable.

COLONIAL CLAY.

(Judges: A. G. Howard, M.S.A.; W. R. Jaggard, A.R.I.B.A.; E. Schaufelberg.)

Best exhibit of Colonial clay suitable for pottery and terra cotta work. 1st prize, £5, Le Sueur & Co.; 2nd prize, £2 10., Lands Development Co.

The Judges remark:—Like all crude clays none of the samples are suitable without the admixture of refractory substances and in some cases of fusing ones. The percentages of Silica range from 23·52 to 48·98, except in one case where it rises to 63·22. The amount of Alumina present is somewhat high, except in one case, but this can be overcome by "combining". Fifteen samples have been submitted, divided amongst four firms, only two of whom shew samples of pottery made from the clay. Of course to make this pottery the clay must have been reinforced by quartz etc.

COLONIAL PAINT.

(Judge: Cecil W. Davis.)

Best Exhibit of Colonial Manufactured Paint. 1st Prize, £5. Doolittle and Milward. for Horne's White Refrigerating Composition, as a Roof-cooling composition.

The Judge remarks that should the Base of the Composition be finely powdered an effective water paint would be produced.

AERATED WATERS.

(Judges: C. F. Juritz. M.A., St. C. O. Sinclair. M.A.)

Although not strictly falling under the head of Colonial made ærated Waters, an exhibit of natural mineral water shown by the Van Riebeek Natural Mineral Water Co., Ltd., was considered deserving of special recognition, and it has accordingly been awarded a Diploma. The Judges after examination and analysis report that the Water contains in sufficient quantity the ingredients necessary to class it as a Natural Mineral Water, and the Ærated Water is very palatable either when used alone or in conjunction with flavouring beverages.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

Chemical Manures for Fruit Trees.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would be glad of advice from any readers of your *Journal* on the following questions :—

A. What chemical manure is most advisable for young trees (two years) on sandy ground, and quantity per acre ?

B. Does dissolved, or crushed bone give good results to bearing trees, and which is the better of the two ?

C. What time of the year should basic slag be given to orchard, Autumn or Spring, and quantity per acre?

I should like advice from men who have had practical experience. Thanking you. —Yours &c

ROWLAND TAYLOR.

Air Chambers on Syphons,

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you kindly inform me through the medium of the *Journal* on the above subject ?

I have a 2 inch (two inch) Syphon—length say 1,800 feet fitted with an Air Chamber, 5 ft. by 5 ins.

A Would you consider one such chamber sufficient for this length of piping ?

B If not, how many, and what size would you recommend ?

C Is there any rule, whereby the size and number of Air Chambers on Syphons is regulated ?

D Is it better to have one large, or two small Air Chambers the capacity of the latter equalling that of the former ?

In Rhodesia I know of a large Syphon fitted with several Air Chambers, to ensure constant and regular work.

I might mention that my Syphon is well put together (no leaking joints), fitted with proper foot valve,(also Put Valve) the latter at delivery and placed under water), and bends (two) are very long and easy so that friction at such bends is reduced to a minimum.—Yours &c.

"PERSEVERE."

P.O. Dwaal, Jan. 31.

These questions are a little beyond our experiences. Perhaps some Correspondent can answer the queries.

The Working of Syphons.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In reply to "Persevere" in your issue of February.

The following may be of some guidance to him *re* the information asked.

1. A 1,700 feet length of pipe with a 20 ft fall free from bends should give about 15 gallons of water per minute, the loss in head due to friction on the above length and velocity amounts to 16 feet

If only 6 gallons of water were allowed to flow per minute the loss of head due to friction would only amount to 2¼ feet.

2. The fall would therefore have to be increased to overcome friction

3. The rate to be determined according to the amount discharged, which will be influenced by the length of suction and the height that the water has to be lifted.

4. The delivery will certainly get less as the water lowers and the suction thereby increases

5. This depends on the velocity of water and the length of suction, of which there is no mention.

6. To insure a Syphon working properly the pipe must run full.

I have found in practice that it is a good plan to reduce the diameter of the discharge pipe in the form of a nozzle at the outlet: by slightly checking the velocity of the water, in this way the pipe will run full, which prevents any air from creeping up inside along the top of the discharge pipe; such air will in a short time accumulate at the bend and the Syphon will cease to flow. An ordinary reducing socket served from 2 ins. to 1½ ins. or 2ins. by 1¼ins., will answer the purpose.—Yours &c.

C.W.

Cradock, 10th. Feb. 1905.

Fatal Indigestion in Cattle.

To the Editor, AGRICULTURAL JOURNAL

SIR,—Could you inform me, through the medium of the *Agricultural Journal*, of what an ox of mine has died? The particulars are as follows —On Tuesday evening, the 3rd inst., my oxen came to the kraal. Next morning I noticed that one of the animals was almost too stiff to get up and also to walk. Its nose was dry, and it did not chew the cud. I isolated it from the other oxen in a paddock. A few hours afterwards I gave it a bundle of oats, which it ate. In the afternoon I took it to the water, and after quenching its thirst, it recommenced grazing, but was still as stiff as in the morning. I then thought that it must have hurt itself, but heard the next morning that there was no change whatever, although it had eaten something. On Friday morning I had it taken to the kraal; it could then not rise without assistance. We now went to administer to it a dose of medicine. It lay with head erect, and seemed to make an effort to get up, lowing all the time. Coming nearer, we found it was dead.

A *post-mortem* examination showed the gall to be of the normal size; its contents were blackish and thick; liver near gall of a red-yellow hue "Blaar-pens" hard and drier than usual. Bladder abnormally large and distended with water; colour of water (urine) was, I think, normal I noticed that the ox had frequently to get up during that night, changing its resting place three or four times, and discharging urine at each spot There was further nothing unusual; intestines and bowels perfectly healthy; dung in "groot-pens" normal.

My farm is situated on Grootrivier, veld dry and destroyed by locusts.—Yours, &c.,

J. C. VAN ROOY.

Kopjeskraal, P.O., Bethulie, O.R.C.
January 6th, 1905.

I am opinion that the ox died from indigestion, associated with congestion of the liver and impaction of the third stomach. This is very often accompanied by a stiffness, similar to Lamziekte. The treatment is to give promptly a strong dose of purgative medicine, such as from 2 to 3 lbs. of Epsom Salts, 1 lb. of brown sugar, and ½ oz. of powdered ginger, Mixed in at least four bottlefuls of warm water—the more the better. As a preventive, give the cattle as much common salt as they will lick, and see that they get plenty of water to drink. The dry veld has probably a great deal to do with this complaint.—D.H.

Agricultural Salt.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you or any of your correspondents kindly inform me where I can obtain agricultural salt, and price per ton, also what quantity should be applied per acre? Yours &c.,

W. A. ROBINSON.

Yore Vale, Kubusie, Jan. 23rd, 1905.

Lifting Water for Irrigation.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would deem it a great favour if you would give me the best information you can on the following subject:—I have been trying for some time to get water from the Tsitsa River for irrigation. The first thing I did was to import one of John Blake's Hydraulic Rams but found it impossible to place same to advantage owing to frequent floods in the river here

I then tried a windmill which works very well indeed when the wind blows, but really only gives me sufficient water for domestic purposes.

The dam into which I want to get the water is on the highest point and at a distance of 350 yards from the Tsitsa River. The elevation is 135 feet, that is to say the dam is 135 feet above the supply of water, which is the Tsitsa River. As before stated the river is frequently in flood, and from information I have received I have almost made up my mind to go in for an Oil Engine powerful enough to fill a three inch delivery pipe, and the information I require is:—

1. What is the best make of engine, strongest and simplest?
2. What distance from the supply of water can the engine house be built?
3. What height above the supply of water can the pump be placed and at what distance from the supply?
4. What is the strongest make of pump to be used under the circumstances?

Yours &c.
DAVID BLACK.

Tsitsa Bridge, *via* Umtata, January 22.

Perhaps some of our readers with experience of this subject will offer a little information.

Bars in Ostrich Feathers.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Having had a vast experience in ostrich farming, dating practically from the advent of this industry into the Colony I read with the keenest interest the explanation *re* bars in ostrich feathers given by Mr. J. G. Liddell in the January 1905 number of *Agricultural Journal,* page 123.

It is indeed gratifying and interesting to note that Mr. Liddell has been able to solve this problematical question, a question upon which I have often approached many old and expert ostrich farmers all of whom have found it impossible to give a correct diagnosis of the defect in the feather. According to Mr. Liddell's theory we must conclude that about one third of the ostriches in the Colony have been subjected to bruises on their feathers while they were in the blood stage by sticks, stones, etc.

It is also peculiar that every feather more or less should have been injured by those terrible bar producing missiles, also that a bird having once had bars is more or less subject to them. I have known birds to have nearly all its young (that is) blood feathers pulled—result, a splendid crop of feathers at next plucking. What about birds who so often have their young feathers tramped out? I will however, admit that the practice if continued would most certainly be detrimental to the growth of prime feathers. I have come to the conclusion after many years of ostrich breeding that bars in ostrich feathers are hereditary.—Yours &c.

G. M. LEPPAN.

Melrose, P.O. Adelaide. February 1, 1905.

Stock Poisoned by Young Kaffir Corn.

To the Editor AGRICULTURAL JOURNAL.

SIR,—Can any of the readers of the *Agricultural Journal* tell me: (1) If young Kaffir corn from 6 to 9 inches in height is poisonous to cattle; if so, how long is it before the beast dies through eating it? (2) Would anyone think that a cow could die eight days afterwards from the effects of eating it? I would also be glad if someone would give me an antidote to be given to stock that had eaten young Kaffir corn. It is an occurrence that frequently happens in this district.—Yours, &c.,

P. M. FINCHAM.

Mateking, Jan. 16.

The Colonial Veterinary Surgeon gives the following in reply.—1. The young Kaffir corn is poisonous when the plant is under one foot high, becoming less so as it ripens. 2 The effects of prussic acid poisoning are comparatively sudden when sufficient to cause death has been eaten 3. I do not think that a cow would die eight days after having eaten young Kaffir corn, at least not from the direct effect of the prussic acid, which the plants contain, as the effects of prussic acid pass off rapidly if the dose is not sufficient to kill. It is possible, however, that there might have been some derangement of the digestive organs of this cow when she ate the Kaffir corn, which an over-feed of that tended to intensify and thus led to her death.

With respect to *treatment*. Heart and nerve stimulants are required, and amongst these ammonia and alcohol act as well as most. Give half an ounce of powdered carbonate of ammonia, and half a pint of good whisky or brandy, dissolved in a bottleful of cold water. Repeat every two hours until relief is obtained. See *Agricultural Journal*, Vol 25, No. 3, p. 273.

Lime and Sulphur Dip.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In your edition of December, 1904, I notice an article under the heading "Scab in sheep and its eradication," by a Mr. W. R. Southey, of Schoombie.

Without being eulogistic or biassed in any way on the subject, and in fairness to this gentleman, I can only reiterate and support everyone of the remarks, which he has put forth with reference to the "infallible" (if I may term it so) "lime and sulphur" dip, with its wonderful propensities for curing scab, provided, of course, the two ingredients be used in proportional quantities.

As to this gentleman's suggestion of prohibiting the influx and use of any imported dips, and making the "lime and sulphur" dip not only compulsory, but universal, I can only say that if this procedure be adopted by all the five Governments in South Africa, the great-and-only-long-felt-want of the farmer, viz.: the eradication of scab from his flocks would be secured; also a considerable enhancement in his annual income would be derived from his wool, which at the present time (owing to the curse of scab in this country) realises a very low price indeed on the markets.

Moreover, in the course of a very few years, we should have the abolition of all scab legislation, and inspectors (which may be very annoying to the farmer, although indispensible) and thus save the Governments many thousands a year, which are being expended to-day, not any too unnecessarily.

My object in taking this matter up, and I trust not to be deemed as being partial, is, that in my conversations with a great many farmers, both of the Cape Colony and Orange River Colony, and not forgetting the Transvaal, I was informed that they objected to the lime and sulphur dip, for the two following reasons:—

Firstly, that the lime affected the wool.

Secondly, that the "lime and sulphur dip" had to be used *hot*.

Now, sir, seeing that this all-important matter has been occupying the attention of all the Governments in South Africa, as well as those of the progressive farmers, I set to, and am proud and pleased to say that after careful and diligent study of this subject, I have invented a "lime and sulphur" dip with three other ingredients which constitute it, which I am prepared, as experiments have proved, not alone to say, but to guarantee, the elimination of these two great difficulties; and last but not least, the omplete and permanent extermination of scab out of scab-ridden South Africa.

If any of your influential farmer friends should care to give my invention a fair trial to prove its merits, I shall be only too delighted to send you a few sample five-gallon tins or send one of my experts down to supervise the dipping whenever convenient for you and wherever you may arrange, at my expense, to prove not only to the farmer but to the Government the efficaciousness and wonderful curative properties of my invention. I can't be fairer, sir.

As experiments have shown and proved, I justly and reasonably claim the following:—

1. It is to be diluted with COLD WATER.
2. It does not harm the wool in any shape or form, on the contrary, it promotes and vastly improves the growth of the wool, once the scab is cured.
3. Once cured, it prevents any future contraction or re-occurrence of the disease, providing they are kept away from other infected sheep.
4. It is positively a non-poisonous dip.
5. It is in a liquid form.
6. It is cheap and within the reach of every farmer, retail price being 15s. per five-gals. tin, enough to dip 1,000 sheep.
7. It is guaranteed to cure scab in sheep, tick in cattle, and all kinds of skin diseases in all kinds of animals, and is a "disinfectant" as well as an "insecticide."

I have great pleasure in informing you that I hold the rights of "letters patent" throughout the length and breadth of South Africa (and have also made application for the Argentine) for this dip, and am in a position to supply the same in any large or small quantities.

Being a local South African industry, I propose calling it the "*The Great Afrikander Lime and Sulphur Dip,*" and should the five Governments of South Africa give us their support by making it compulsory, if it proves itself to be what we say it is, and which is all we ask, we are prepared to establish factories in every respective Colony should it be found necessary for the acceleration of the manufacture of the dip.

In concluding, you will, no doubt agree with me, sir, in saying that if the Governments will entertain this "*South African Industry*" favourably, it will beyond all shadow of doubt, benefit the whole of South Africa in a great many more ways than materially increasing the revenue of the country, which is of vital importance.

Thanking you in anticipation of you inserting this humble epistle of mine, and with apologies for the encroachment on the columns of your esteemed *Journal.*—Yours, &c.,

H. GELDARD,
of MESSRS. GELDARD & NEWELL.

Kroonstad, February 13.

Ground-Eating Calves.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have a couple of young calves sick, purging very badly from the effects of eating too much ground. Will you kindly let me know by return of post if you know of any cure for same? Why do calves eat ground and how can it be prevented?

By same post I forward to you some grass which I found on part of my farm Afgunst. Can you tell me what it is and if good for stock. It seems very hardy and not easily rooted out.—Yours, &c.

JOHN C. P. READ.

Matjesfontein, Plettenberg Bay.

The Colonial Veterinary Surgeon says:—Judging from the locality from which Mr. Read writes, I fear that there is a want of phosphates as well as of other Saline material in the vegetation, which induces his calves to eat the ground. On the other hand young calves which are still getting milk do not feel the want of these saline ingredients so much as animals which have only the veld to live on. I am, therefore afraid that his calves are suffering from indigestion and an acid condition of the stomach, and that they eat the ground to allay the sensation which we call "Heartburn." At any rate I would recommend that the calves get from one to three ounces of Epsom Salts depending on size and age, dissolved in warm water, this to be followed twice daily with two ounces of lime water before each feed, stop the milk for a day or two, and give a little barley water.

The grass you send is a very valuable fodder plant. It is a local (Cape) variety of Italian Rye Grass.

Sample Specifics for Farmers.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We have just landed various samples of preparations which South African farmers might wish to try, viz. —

Locust Killer as used by the Imperial Government in the Island of Cyprus, per tin 4/6.

Specific for Worms in all classes of stock, per tin, 4/6.

Carbolised Wheat Dressing for Smut, Rust. etc., per packet, 1/3.

We are also prepared to send gratis to bona-fide farmers, samples of drench tubes for administering medicine to stock, and also our 1905 Calendar. Applicants will be supplied in order of application but subject to the widest distribution. As the postage on the locust killer and wheat-dressing is eightpence per pound we are compelled to make a charge and we will pay carriage on the worm specific to any railway station.

Thanking you for kindly inserting above at your convenience.—Yours, &c.

HAYWARD, YOUNG, & CO.

Port Elizabeth, Jan 24, 1905.

Worms in Lambs.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Reverting to page 728, *Agricultural Journal* of December, 1904, the following letter from Mr. C. G. Palmer, near Grahamstown, may be of interest to your readers:—

"Fair Holm, near Grahamstown,
"Dec. 11th, 1904.

"Sir,—I have used "Fletcher's Albany Tick Dip" for my sheep, and found it the best and cheapest Dip that I have used, as it kills all the ticks and removes all the tape-worms from the lambs.

"(Signed) CLIFFORD G. PALMER."

I may add that Mr. Palmer did not separate the lambs from the ewes after dipping, and consequently while sucking, the lambs took in small quantities of the Dip—a natural and extremely effective way of administering the dose —Yours &c ,

G. D. ATHERSTONE,
Manager, Fletcher's Dip.

"Megrims in a Cockerel."

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Some time ago my white leghorns got roup. One very fine cockerel, when getting better, used to suddenly throw his head back and shake it till he almost fell, whenever he ran, and sometimes when standing quietly. He eventually got completely paralysed, and was unable to balance himself. I then killed him. I notice now that one of the other cockerels is doing exactly the same thing with his head, and I would be very glad to know: 1st. What he has got? 2nd. What is the treatment?—Yours, &c.,

GEO. R. W. WILKINSON.

Vosburg, Jan. 16.

In reply, the Chief Veterinary Surgeon supplies the following memo.:—With respect to "megrims" in a young cockerel following an attack of "diphtheritic roup." As roup is characterised by a specific catarrhal inflammation of the mucous membrane, which lines the cavities of the head and face, accompanied by a croupous exudation into all these cavities, it is very probable that this specific exudate may have extended from some of these cavities, such as the fauces, nasal chambers, the orbital cavities, or the ears into the cranial cavity, where its presence would cause pressure upon some of the roots of the motor nerves and interfere with their action. We have analagous cases in other animals. For example, abscesses may form in the brain after strangles in a horse. Of course, it is possible that there may be some other cause of the "megrims" and paralysis, such as a direct injury to the head, causing the rupture of a small blood-vessel or an effusion of serous fluid at the seat of injury, either of which would induce the symptoms referred to; the association with a previous attack of "roup" being merely a curious coincidence, I merely refer to probable causes in the absence of an examination.

Fixing Drift Sands.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I am sending you herewith some specimens of grass which I found growing just above high watermark on the beach near the mouth of the Klein River between Hermanus and Danger Point.

Is it one of the species with which Government has been experimenting at other parts of the coast. A couple of years ago it did not exist at this spot. It would appear to have washed up from the sea and have taken root on the pure white Drift sands which extend for many miles along the coast and are rapidly encroaching and ruining valuable Government and private lands. It would be a splendid thing if its growth could be encouraged by Government and a large tract of country reclaimed which formerly afforded good grazing for a large number of cattle, but which is now worthless. —Yours &c.

F. GUTHRIE.

Caledon, 25th Jan. 1905.

The grass is *Triticum junceum*, well known for binding drifting or moving sands. It is not used for this purpose by the Forest Department, as Marram grass is found preferable. *Triticum junceum* spreads rapidly, but must be protected from stock or very carefully grazed as cattle like it so well that they are apt to eat it out.

Lime and Sulphur vs. Imported Dip.

REPLY TO MR. S. ROWLAND TIMSON, GENERAL MANAGER, COOPER AND NEPHEWS.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Were it not for the large percentage of sarcasm in Mr. Timson's letter, I would have thanked him for his complimentary preamble. I only profess to be a practical farmer and will try to compare notes with Mr. Timson.

The use of Lime and Sulphur as a cure for scab does not require to be so very carefully and accurately weighed as Mr. Timson tries to make me say. If poisonous dips are not carefully used they would not only injure but kill; Lime and Sulphur, however carelessly used, will neither injure nor kill the animals upon which it is used. Lime and Sulphur need not be heated or kept hot during dipping. I will undertake to cure any scabby sheep, Mr. Timson can produce, by dipping in Lime and Sulphur cold.

Lime and Sulphur, has been said to cure scab, as a trial, without being boiled; merely by mixing the ingredients with cold water and allowing the mixture to stand for some time before dipping. But it is so simple and easy to mix and boil Lime and Sulphur, I would not recommend the experiment. I have boiled sufficient Lime and Sulphur to dip 1,000 sheep in a fair sized soap pot, using only two wheel-barrows of mest. A farmer owning a comparatively small flock of sheep would have sufficient mest not only to boil his dip but to supply his whole household.

If farmers are capable of carrying out the directions given them for the use of poisonous dips they are capable of carrying out the simple directions for the use of a non-poisonous dip such as Lime and Sulphur. The practical problems to be faced in the use of Lime and Sulphur can be carried out by anyone but an idiot.

If the Government, as stated by Mr. Timson, could not cure scab with a cold Lime and Sulphur dip they could not cure it with a hot dip or any other dip. The first and most important point with a sheep farmer is to eradicate scab, and grow his wool without dipping, except for ticks and lice after shearing; there will then be no question on the score of dyeing.

I thank Mr. Timson for the large number of letters and testimonials. Lime and Sulphur does not require such an amount of cracking up; try it once and like Pears' Soap you will use it always and use no other. The use of lime and sulphur will raise the price of wool for the simple reason that it will eradicate scab.

The opinion that only lime and sulphur should be used to eradicate scab is not Mr. Southey's only. It is the growing opinion among all the most enlightened and progressive farmers. I have no doubt Messrs. W. Cooper and Nephew's books will show up well if inspected as suggested by Mr. Timson. That, however, is not a proof that scab has been eradicated, rather the contrary. The thousands of farmers mentioned by Mr. Timson as spending their money uselessly does not speak well for imported dips; had they used lime and sulphur it would have been better for them and the Colony.

Lime and Sulphur I admit is only a dead instrument like all imported dips but it will eradicate scab. If the Minister for Agriculture when shaping his new scab act insists upon farmers cleansing their sheep of scab, leaving them free to chose from among the good, bad and indifferent dips, of which they know absolutely nothing, and give them no rest or peace as suggested by Mr. Timson until they can shew a clean bill, I pity them, their pockets, and their unfortunate sheep.

I might quote numbers of cases where imported dips have failed and lime and sulphur cured, as well as acting as a preventive but it is useless riding a dead horse. In conclusion I will mention a case of a careful farmer who is anxious to know on which side his bank balance stands, and therefore kept a strict account of a flock of 800 sheep, purchased, having been dipped by the previous owner in imported dip but still scabby. These sheep were shorn with about nine month's wool on the 1st Nov. 1901. The wool was sold at 5d. per lb. and realised £64 9s. 9d. The flock was then twice dipped in lime and sulphur when 100 were sold, the same flock was shorn on the 1st Nov. 1902, numbering 700, still perfectly clean without being dipped, the wool sold at 5½d. and realised £134 4s On the 1st Nov. 1903 the flock was reduced, by selling, to 640 when they were again shorn on the 1st Nov. free of scab without dipping. The wool sold for 6½d. and realised £155 8s. 6d. On the 1st Nov. 1904 the flock was again reduced by selling to 575; they were again shorn still free of scab without being dipped, and the wool sold at 7d. per lb. and realised £155 10s. 10.

I may mention that when selling only the best were retained. Sheep farmers should make a special note of this, dip only in lime and sulphur, weed your sheep carefully after every shearing, selling all the inferior ones and your bank balance will come out on the right side not having spent your money uselessly.—Yours &c.

W. R. SOUTHEY.

Varkens Kop, February 17th, 1905.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In reading Mr. Timson's letter in the February number of your valued *Journal*, I noticed that he says that lime and sulphur dip should be "heated and kept hot." This has not been my experience. I have always found that it has been effective if used cold.

I have been farming with sheep in the Queenstown and Tarkastad District since 1877. I will say nothing about the years 1877, 1878, 1879, 1880 and 1881 as I was so much away from home during those years, having served in the Kaffir Wars, that I was unable to give the attention to my sheep that I should have done, had I not been called away on Active Service. Since 1882 whenever, I have been obliged to dip, owing to have to move my sheep and picking up the disease on the road, lime and sulphur has not only cured the sheep, but they have remained clean for years till drought again obliged me to take them to graze elsewhere.

On the other hand whenever I have used imported dips, I have never been able to eradicate the scab for more than a few months.

I have dipped my sheep with 15lbs. of sulphur and 15 lbs. of lime to the 100 gallons and they have remained clean for three years.

Lime and Sulphur is so effectual that it is surprising to me that it is not universally used.

Farmers should clean their sheep first by using Lime and Sulphur, which I am convinced they would do, if they prepared it properly and kept their sheep in the bath for two minutes, then let them use other dips, *which are not so much trouble*, for ticks, lice, &c.

I have often used Cooper's Dip myself and must say that I have never lost any sheep with it and I believe that if the instructions are carefully carried out, it is perfectly safe, but at the same time I must say that I have never been able to keep them clean for many months after dipping, although I have been just as careful in preparing the stuff and have kept them in the dip two minutes which is in my opinion, quite long enough As to lime and sulphur doing the wool any harm, if the sheep are clipped *within a month of shearing*, that I cannot understand. As I have not been in the trade I have not had the opportunity of asking a manufacturer.—Yours &c.

FRANK H. COCKIN, J.P.

Waverley, February 17th, 1905.

The Working of Syphons.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In case no better informed person replies to "Persevere's" queries *re* syphons in your February number I can give him the result of my experience.

(i.) I find water delivered varies directly with the fall irrespective of distance, *i.e.*, in case B the water delivered would be one-fith that delivered in case A.

(ii.) In order to deliver at the same rate, "fall" would have to be slightly increased to allow for friction over the increased length.

(iv.) Delivery lessens exactly as the fall lessens, the "fall" being the difference in level of surface of water at "supply" and "delivery."

(v.) I do not know the rates of delivery of 2in. pipes.

(vi.) Yes.

(vii.) Yes, if the discharge is not sufficient to prevent it. Entry of air is prevented effectually by keeping the discharge end of the pipe below the surface of the water. Or, of course, by reducing the opening or increasing the flow. The first is the simplest method, being easily managed and absolutely reliable.

(viii.) If the discharge of water is too slow, or the pipe too level or too open.

The fall of delivery pipe may of course be greater than 2½ ft. or 34 ft. either, for that matter, if there is enough water.—Yours, etc.

LAWRENCE C. FRENCH.

Maclear, 13 Feb., 1905.

Lambs Dying.

To the Editor AGRICULTURAL JOURNAL.

SIR,—During the last few weeks I have lost a number of lambs, and although I have asked numerous farmers about here, none of them seem to know what is the cause of the disease, nor can they recommend a remedy.

When the lambs started dying about 3 weeks ago I found they were infested with tape-worms and also the lungs were diseased; in several instances the lungs stuck fast to the ribs and were very much inflamed, in places being almost the colour of the liver.

I dosed them all for tape-worms, following the advice of Mr. Fred J. Pentz in the November *Journal*, giving each one a small dose of Cooper's Dip and I found they passed quite a lot of worms.

The lambs are still dying, but I find no traces of worms, the lungs in each case being slightly inflamed and in places quite rotten.

I shall be very glad if you can suggest a preventive, and also recommend a remedy r the disease.

The lambs vary from 2 to 4 months old.—Yours, etc.

P. GENT

Kroonstad, O.R.C., Jan. 28.

It is very difficult to give a definite opinion respecting the cause of the death of Mr. Gent's lambs. The disease of the lungs can hardly be due to worm in the bronchial tubes—as there is no mention made of coughing as a symptom which they would manifest if affected. The lungs may become affected by exposure to cold rain—more especially if they have to stand up to the knees and hocks in a wet kraal. The lungs may also become affected while dipping if the sheep are carelessly thrown into the tank and overcrowded.

I am, however, of opinion that the lungs are only affected in a few lambs and that the principal cause of death is internal parasites—most probably wire-worm in the stomach—if there are no more tape worms in the intestines.

But it is impossible to give a definite opinion without a personal examination.

As Mr. Pentz says that he has been completely successful in cleaning his sheep of worms by the administration of Cooper's Dip, Mr. Gent should try another dose. A very good method of keeping them clear is to give a little Cooper's Dip with the salt which they get to lick daily, the mixture is one of Cooper's powder to twenty of salt.—D H.

Stockholm Tar and Heartwater.

To the Editor, AGRICULTURAL JOURNAL.

SIR, In your February issue before me, "Persevere" page 275, writes on "Stockholm Tar and Sheep Dips." Will you kindly ask him what quantity he gives to a full grown sheep for a dose every three months, also whether it would harm to give the dose more often. I must you tell that I dosed with the tar once a fortnight for what I believed to be heartwater, as a preventive ; and was successful in stopping same.

I will describe it, and ask you please to give your opinion as to whether it was heartwater. On opening a sheep we find about a quart of water in the lung and heart cavity ; with a slight yellow tinge and the least bit slimy. This happened on the 15th August last after they had been on the farm six weeks. I lost twenty in five days ; my old native herd said it was not like what his previous master in Bedford district shewed him for heartwater which was in the heart bag only ; all the cases he saw there were in goats. My sheep are first cross and one Persian ram, he also took sick but soon recovered. He shewed the same symptoms—heavy breathing and appeared to suffocate to death.—Yours, &c.

"INQUIRER."

Glen Heath, Bathurst
February 13.

Stockholm tar may be given at short intervals with safety and benefit. Many farmers give their sheep a mixture of common salt and Stockholm tar continuously and are convinced that it is a preventive of worms, and such diseases as Malarial Catarrhal Fever—or Blauwtong.

The dose for a lamb is a teaspoonful and for a sheep a tablespoonful. I would not like to state that it will prevent Heartwater, although "Enquirer's" experience appears to indicate that it exercises some beneficial effect. From "Enquirer's" description of the symptoms and post mortem appearances which his sheep exhibited I am of opinion that it was Heartwater which they suffered from. The fact that the Persian ram took the disease and recovered also points to the disease being Heartwater.—D.H.

Sluiting—Causes ? or Effects ?

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read the many opinions of the many minds giving their views on the causes of "sluiting" in the now widely read *Agricultural Journal*, and with few exceptions, the causes to which they ascribe them, are not really causes, but properly speaking—effects ; and so far from sluiting being a local Karoo matter, it is wide-spread and wider-spreading throughout Africa, although each sufferer knows best where his own shoe pinches.

In a short article in the *Agricultural Journal* it is difficult to give advice, or even to offer suggestions, seeing those suggestions may differ so materially from what the sufferers would prefer to believe; but as *truth* like art, appeals to the inner consciousness of truth innate in everyone, so, with your permission, I would appeal to that rather than attempt to convince a man in the face of inherent obstinate disbelief.

It is admitted by all that sluiting is of recent origin.

The oldest inhabitants of this country are the natives, and one of their strongest and best founded proverbs is that when the white man comes into their country, the rain goes away. They have, by constantly associating two concurrent events, accurately gauged the cause of the effect, and proven their proverb.

Mr. Sim, the District Forest Officer, in his article, believes—and let me say rightly believes—in tree planting as a remedy, but as he totally fails to show how trees can be made to live without moisture, he begins at the wrong end; because the moisture necessary for the partial re-afforestation he advocates is not there; nor could it be depended upon afterwards, should one good season shew apparent warrant for the attempt. Beyond this there are no financial or commercial prospects calculated to justify the investment of immense sums in an area of "the greatest repulsion" (which I will explain later on.)

The letter of A.S J., Beaufort West (a letter the writer should have been proud to have signed in full) in your January issue—breathing conviction in every line—sarcastically deals with the impossibility of beginning at Mr. Sim's end; and the letter—like all farmer's letters—displays a practical and convincing knowledge of his own affairs, not possessed by the theoretical, or the dwellers in cities.

Then there is O.B, Herschel (January), another modest writer, stating that his part of the country was once well wooded and an open game country; (picture to yourself the rivulets, the waving pasturage, the heads sticking out of the grass, the wild olive trees, the thoroughly *African* scenery, and contrast it with the present aridity) further showing that Mr. Sim's remedy is purely theoretical and impracticable.

Take further instances here, on the coast (Bathurst), one of the most favoured spots in the East, and we find that although "sluiting" is less pronounced, and less conspicuous, that the same relentless devastating forces are at work; for, where once was the matted undergrowth and the tall yellow-woods of the coast "bush"; the ravines clothed with maiden-hair ferns, festooned in beautiful creepers, and all the luxuriance of the coast flora; we see the hollowing trees, the stunted growth, the fire swept, rock-bottomed ravines, the gradual obliteration of the outlying patches of bush and all in full sympathy with the gradual drying up of the country.

Our coast-bush contains countless thousands of "game-rolls," where hippopotami, elephants and buffaloes wallowed for centuries; and as recently (in parts) as only forty years ago; which to-day are small vleis, carrying water only after exceptional rains—which further confirms O.B.'s statement.

We might even look further afield than this, and instance the great lakes of Central Africa shallowing year by year.

Are these then, Causes, or Effects?

Results, or secondary effects, would be a better term, because the true effect, is the want of water, coupled with the way in which the inadequate supply is received.

The cause or causes of these effects is a much deeper subject, one I almost fear to touch upon, yet, probably, like the truth of the native proverb previously quoted, may become capable of association.

The question then arises:—Is the gradual drying up of Africa, and the want of "softness" or moderation in our rainfall similar to the eroding forces of nature which Tennyson so beautifully expresses:—

> The hills are shadows, and they flow
> From form to form and nothing stands:
> They melt like mist, the solid lands,
> Like clouds they shape themselves and go.

Or, are they not perhaps the definable results of man's occupation; together with the fact that his working, or cultural methods, are not in unison with the laws of nature?

Now the first aspect, that so well described by Tennyson, *is* in unison with nature, because it is nature herself.

The working of nature's perfect laws have provided for the requirements of the habitable world to-day, and given us our coal beds, metals, oils, &c., being made and preserved by the so-called eroding forces of nature, incessantly at work through all time; and which are diametrically opposed to the process, called sluiting, which nevertheless is subject to the same government.

So far as I can grasp the subject, and the grandeur of the thought—any thing else, would imply a cessation of the forces which must be, and are, as incapable of change, as the mighty Creator of all things; the same yesterday, to-day, and for ever.

Having then a solid argumentative foundation whereon to build, we may positively infer, that man, by having disturbed the balance of the harmonious relationship existent in nature, has created, for former attraction an un-natural repulsion; yielding as consequences a diminished, yet more ruinous rainfall, to which "sluiting" has been correctly ascribed.

By "repulsion" I mean in this instance—nothing more, than the absence of *attraction*.

Rain will not fall in moderation without some degree of attraction (unison) and if repulsion exists, and it be overcome by the force of stronger influences; the ensuing rainfall will necessarily be of a heavier, and more devastating character, than if repulsion was never existent.

I have had many opportunities (by vocation and residence) of proving this, year after year in the Free State, as also in Kimberley. I have repeatedly seen unbroken solid masses of thundercloud heavily charged with rain, open out and pass on both sides of Jagersfontein, closing together on the other side with nothing but a dry dust-storm in the town, whereas beautiful showers fell all round.

Or again, storms rising, when the town would not be in the direct line of its track; deflected by the repulsion of the hot iron roofs to an enormous degree, sometimes bringing it to a standstill, and causing it to empty itself out in one spot.

Again in the North-East Transvaal, where droughts were practically unknown, thunderstorms gathering, condensed by the vibration of lightning; and torrential rains falling with no apparent damage whatever.

All over the De Kaap Valley, before the great rush of 1886, were sluits, often sixty feet deep; in places less than six feet across at the top (*i.e.* surface), with soft earth for thirty feet, and perpendicular sides, kept from "sluiting" by the luxuriant growth of grass and bush-roots forming "umbrellas" projecting as far as six feet over, on either side, strong enough to support an elephant.

Some of these same sluits two years later, had widened very considerably by falling in, the supporting "umbrellas" being burnt by gold prospectors at the height of the dry season; yet, I estimate these dongas, gullies, or sluits at not less than two thousand years old - or they might possibly be more correctly estimated at nearer twenty thousand years.

Before I attempt to piece these facts together, let us take more instances of attraction and repulsion within Cape Colony.

It is a recognised fact here, as it is also in the Free State, that all thunderstorms ollow the same track right through the summer, as that traversed by the first storm of the season.

It is often stated, that storms (rain) will follow the track of a river; run along the highest hills; or the thickest wooded parts, and that they do do so is well-known to all farmers.

These are all instances of attraction, in contradistinction to the repulsion of the less favoured spots—*i.e.*, where rain does not so readily fall: but, if far-reaching thunderstorms occur, in, or out of the zones of attraction: the repulsion or attraction of any particular area, becomes neutralised, equalised, or overcome by stronger (magnetic or electric) influences, and both participate equally in the land rains that ollow.

(I would like to add a parenthesis here, to say that the words or phrases I am using, are to make my brother farmers follow more clearly what I am doing my best to drive home, so that we may quicker believe "sluiting" is coming our way).

It is however clear to my mind, that the absence of attraction—or in other words, the absence of soft refreshing showers between the rain periods is at the bottom of the whole mischief to-day. The reasons for it, as given by others are all perfectly correct.

And now to apply the larger scale:—I have tried to show, that unless attraction, is ever present, to give us the moderate showers, necessary for the growth of "protection"; we can expect nothing but drought between, and only participate in the heavier general rains, which will remove all the loosened soil from lack of protective grasses.

I have tried to show also, that the more repulsion increases in any area, the less the attraction still remaining has power to exert its diminishing influence—until at last attraction ceases altogether.

We have seen again that the repulsion of one area can deflect, or turn away, the soft rains that would have fallen therein if attraction had predominated.

Then again others, than myself, have shown, that the planting of trees locally is at present impracticable, and is not the primary remedial measure :

The question that occurs now is this:—Seeing that pasturage and forest possess in themselves (being the chief local factors in) the power of attracting rain: and further, recognising the impossibility of growing either by a reversal of the process, can attraction be artificially induced? To which I reply, yes. But it opens up an immense field, and an infinitude of questions. However, not being a paid official, or an expert on anything but orange-growing, I have no reputation to lose as a possible rain-maker!

I have never read a scientific work or any matter even nearly approaching these questions and can only offer my own humble original observations thereon in support; but the question of artificial attraction suggests two principal questions, which no one on earth to my mind can answer—

(i) What are the causes of diminishing rainfalls?

(ii.) What is electricity?

Science, in the light of meaning "knowledge reduced to a system" does not admit God, as the Creator and Maintainer; whereas I do. Such a confession is termed faulty argument, weakness? But it is the first essential of knowledge—to have a true foundation.

We speak glibly of our sun-spots; the gulf-stream; areas of calm for rain; we associate the tides with the phases of the moon, and hundreds more "associated happenings" too numerous to mention; forgetting in the pride of our own intellect, and in the race for wealth and boasted ivilisation, the laws of God—which govern all things.

The greed of man is the disturbing element in nature, in every case, no matter whether we call it by the names of "over-stocking" forest or pasture denudation, by the agriculturist; (which I consider matters of local "repulsion") or whether it be the scientist voiding or subverting the secret forces of "nature" to what may be termed unnatural uses, without returning compensating substance the fact remains—that if my theoretical bases have been correctly assumed, nature is out of tune by imperfections in the prided knowledge of man

These chimerical (?) statements—like Jules Verne's submarine voyages—may yet be found *ipso facto*.

No one knows what electricity is. We use it unstintingly, we harness it, we give learned powers and equations, yet, like the wind we may "hear" it, without knowing its origin or destination.

It is known to the Japanese scientist, that a driven dynamo, carrying current to a point of eminence, has the power of attracting and inducing rain over a three mile radius: yet we fail to associate therewith the voiding of the life and rain-giving electricity for all the uses to which we put it, with a diminished rainfall.

We further fail to believe that as this thereby created repulsion of the world increases; the points of attraction receive abnormal rains; yet investigation will prove convincing. Science discredits the "will of nature" to work by measure; or that the lesser laws are as the greater, erroneously.

I have tried to show how the loss of attraction in one area (Karoo) is—although at present not fully recognised—extending its sphere of influence, like ever widening concentric circles to the limits of the rain zone, until in time, it affects the next belt, region or zone.

With that we can also mentally connect the "piling up" of the cloud banks (in reality due to fall therein) on the fringes of the Karoo, raining out its wealth on the sea, to the attraction of the sea: and the increasing repulsion of the land.

Now we turn ourselves round and ask for enlightenment on the causes.

A day of humiliation is spoken of. A day to be kept by whom? For what?

To patch up broken laws to break again? So that the greed of man may have full sway!

Do I seem irreverent? Yet I know the prayer of faith to be all-powerful, irresistible, omnipotent.

What then! do I simply criticise my brother agriculturist? By no means—I suggest rather the remedy of amendment, and in this way:—

The first step is to stop the expansion of what we now better understand by the word "repulsion"; and to force attraction on the fringes by tree planting on the lines of Mr. Sim, thereby reversing repulsion, by a widening attraction.

The present area of repulsion is doomed—now, or in the early future, and without immediate remedial measures; the next zone also, in the ratio of nature's inexorable law.

In conjunction with that first step, to promote attraction by artificial means viz:—By dynamic energy (electricity) on the lines of the Japanese successful methods. Thereafter by reclamation—on well recognised common-sense lines—to secure every mile so won, and at the same time adding the power of the attraction in the reclaimed area, to the artificial means employed on the fringes, until reclamation is complete.

The opportunities will become more and more frequent, because what I will call once more *nature* acts on generous lines, when amendment is sincere.

Listen to no hypothetical rain cycles, or vain imaginings of normal rains, act, because God helps those who help themselves.

W. E. Masters,
Coombs Forest.

B thurst District.

RURAL REPORTS.

For the month ending 15th February, 1905.

Aberdeen.—Weather still promising. Soft rains have fallen at some places on the 7th and 8th instant. Veld in dry condition. Mealies badly in want of water. Fruit not doing as well as was expected on account of drought. Cattle are mostly in poor condition, as are also veld-fed horses. Merinoes and Angoras still doing fairly in spite of drought Not many Cape sheep and goats in district. Ostriches are also still keeping well.

Bedford.—Karroo and grass not only dead but trodden down and broken up and only roots appear to be left. Stock feeding principally on Mimosa and other tree leaves. Weather typically drought inclined with a prevalence of South winds. Rainfall only 0·32 inches instead of 2 or 3 inches. Wheat, oat and mealie crops burnt up by drought. Fruit has also suffered very much and is wanting both in quality and quantity. Cattle in very low condition. Slaughter animals scarce. Sheep and goats are doing better than large stock and slaughter animals are fairly plentiful. Ostriches are doing badly. Full grown birds in very low condition while a great number of the young birds have died and increase in chicks has been small.

Carnarvon.—Weather hot, dry and windy. Rainfall for the month has been light and below the average. Veld dry and scanty. A small crop of mealies now coming on. Cattle in bad condition and no slaughter stock. Horses, mules, etc., in good condition and values high. Sheep are in poor condition and goats fair. No breeding.

Clanwilliam.—Our veld is in fair condition for this time of the year and although there has been no rain. Weather at present hot and dry. Wheat, oats and other grain have yielded fair and good crops. Very little lucerne grown here. Fruit in promising condition, grapes especially. Peaches, apricots, pears, apples and tomatoes are all infested with worms. Cattle are in good and healthy condition. Calving season has been satisfactory. Slaughter stock realising good prices. Horses are doing very well. Draught animals scarce. Mules and donkeys plentiful. Riding horses fetch £25 to £35 each. Draught animals £50 to £60 per pair. Mules £20 to £30. Sheep in fair condition, no sickness and little scab. Lambing season good. Slaughter stock scarce. Goats in good condition and have bred well this season. Ostriches doing well. Pigs thriving.

Hay.—Light rains only have fallen so far, not sufficient to improve veld which is bad and dry. Unless more rain falls soon prospects will be very poor. Fruit troubled with worms. Livestock of all descriptions are in very poor condition.

Namaqualand.—We are having hot and oppressive weather just at present. The month's rainfall has been very light and less than last year. Veld is in bad condition. Wheat and oat crops are very small owing to drought. Cattle in fair condition. Horses, etc., good and prices firm. Small stock are also in very fair condition. Ostriches indifferent.

Oudtshoorn.—Weather during the last month has been hot, windy and dry. Only very light and partial rains have fallen and more water is urgently needed. Veld for the most part very dry, though fair in places. Very fair crops of oats and wheat have been taken. Mealie crop does not promise to be very large owing to drought. Very good and heavy crops of lucerne have been stacked though caterpillars are doing a deal of damage in some wards. Fruit is in good condition all round. No insect pests or disease. Vines are also bearing heavily and good crops are expected. Throughout the district livestock of all description are doing well. Markets firm and prices on the whole low. Young ostriches suffering somewhat from lack of water.

Queenstown.—We are experiencing very changeable weather at present, hot in the mornings and cold at night. Frost two mornings last week. Veld in very bad condition and scarcely a blade of grass to be had. Rainfall only ·91 inches, *i.e.*, about a third of the average. Fruit crop very poor and small owing to lack of water. Cattle in low condition. Horses fair considering the drought. Sheep in fair condition, most away on mountains seeking pasture. Slaughter animals good considering the severe drought.

Richmond.—A soft soaking rain has fallen, and veld is in good condition. A few swarms of locusts have made their appearance. Weather very changeable and windy. Weather crops looking well. Cattle in fair condition and free from disease. Slaughter stock still in poor condition. Horses are not so good for this time of year. Draught animals scarce. Prices very high. Sheep and goats are doing well. Very little scab. Ostriches thriving.

Riversdale.—Last month's weather was hot, dry, and windy. Rainfall very light. Veld dry, though still fairly good in places. Wheat and oat crops have been fairly good. Also lucerne where grown. Fruit below average. Cattle are in fairly good condition. Slaughter animals scarce. All other live-stock doing well.

Robertson.—No rain has fallen here yet, and veld is in very bad condition, and getting worse every day. Prevailing weather warm and dry. Oat crop has been very good. Wheat suffered from rust. Barley also yielded well. Lucerne very dry, but still growing. Fruit not as good as last year. No disease. Live-stock are in good condition.

Somerset East.—Weather has been fine; hot during the day, but mornings and evenings cool. The drought has not yet broken, although copious rains have fallen in the north-western and southern portions of the districts. On some farms springs never before known to fail have dried up, and great difficulty has been experienced in obtaining water not only for stock, but for domestic use. Pasturage, although very dry, is fairly abundant. Large stock are rather low in condition; small stock are doing fairly well. No mealies have been sown. The outlook is certainly not encouraging.

Vryburg.—We have had intensely hot weather here, with hot, dry, scorching winds prevailing. Only light rains have fallen and drought is still unbroken. Veld good in some places, but bad in others. Crops have failed on account of the drought. Small sowings of mealies and Kaffir corn have been put in and are looking well. Fruit of all kinds very scarce owing to unseasonable frosts and the drought. Cattle in fair condition. Lamziekte bad on some farms. Horses are doing well. No sickness reported. Sheep and goats in fair condition, though not as fat as usual. Ostriches doing well. Pigs fair.

THE TRANSKEI.

For the month ending 31st January, 1905.

Bizana.—Good rains have fallen throughout the district, and the country round has consequently assumed its summer garb. The growing crops promise fair, and if the rains continue there will be no scarcity of grain. Stock of all kinds are now in good health and condition, only one case of Lungsickness having been reported during the month. The usual steps have been taken to prevent any spreding of the disease.

Cofimvaba.—I have the honour to report upon the agricultural prospects of this district as follows: Rain to the extent of 1·67 inches fell during the month, in time to save the standing crops of mealies and to enable the people to plant forage and wheat crops. The yield of mealies will be very poor this season, while as to Kaffir-corn there will be none at all, owing to drought at the time seed should have been planted. The Natives are planting beans more extensively this year. Two outbreaks of Redwater occurred in the district, and the usual precautions were taken to prevent the spread of the disease. With the above exception, stock is free from disease and are improving in condition.

Flagstaff.—During the past month we have had 3½ inches of rain, and this has freshened the country up wonderfully. The pasturage and standing crops are much improved, though the crops are very backward, and if we should get an early frost, considerable damage would be done. Stock are doing well and are free from disease.

Idutywa.—The rainfall registered in this district during the current month is 1·74 inches, and there is a slight improvement in the pasturage. Stock, both large and small, is in fair condition, and the district is so far free from contagious diseases.

Kentani.—Until the recent rain fell, matters as regards agriculture and live-stock were beginning to assume a serious aspect, but all is now changed: the crops of mealies have been saved, and are now looking very healthy. There are prospects of a fair harvest if the rain continues to fall at regular intervals. The pasturage has also improved, and there will be abundant feeding for the stock during the coming winter. Cattle are in fair condition, and no outbreaks of disease were reported. Locusts have appeared along the coast, but up to date it has not been reported that they have done any damage.

Libode.—At last the rain has come, and the draught has broken, but it is too late for the mealie crop In some parts of the district, however, the crops are fairly well advanced, but it is feared that the bulk of the mealies sown will not ripen. The Natives, however, are putting in beans. The rain has brought on the grass, and the veld is beautiful. Stock of all kinds are looking healthy and sleek.

Matatiele.—An abundant rainfall was registered during the past month throughout the district, the record in this village showing 7·23 inches distributed over seventeen days. Farmers are busy sowing winter food, and the Natives are hoeing their mealie and Kaffir corn crops which as previously reported are very backward, and the yield of which will depend upon the frosts coming late. Redwater has broken out in a number of places and quarantines established. In some instances the infection is traceable to traffic from Richmond, Natal. It does not appear to be generally known amongst farmers and others that redwater is a contagious disease under the Animals' Diseases Act, and it would be as well to have uniformity of action in the various districts and either have the disease taken from the list of Contagious Diseases, or have the Act enforced. Except for redwater large stock are doing well, also small stock.

Mount Frere.—Very good rains have fallen during the month reviving the veld and crops which have shot up with marvellous rapidity and there is now hope of a fair grain crop Stock has wonderfully improved but I regret to add with the flush of grass has come gall sickness and during the last week several cases of Redwater have been reported. One outbreak of Lung sickness has been reported, the usual precautions have been taken and it is hoped the disease will not spread. There has been an increase in scab amongst sheep consequent on the mixing of flocks during the drought Horses are still very scabby and biliary fever is prevalent.

Ngqeleni.—Some very good soaking rains have fallen during the month and in consequence the veld is in splendid condition. The Mealie crops in the upper part of the district are in fair condition and towards the coast they are already well advanced. Should there be no early frosts there is every prospect of a very fair harvest. Stock, both large and small, is in good condition and no reports of the outbreak of any animals' diseases have been made to me.

Nqamakwe.—During the early part of the past month a little rain fell, the natives in some parts of the district took advantage of this rain and ploughed. The veld looks very much better and there is an improvement in the large and small stock.

Qumbu.—The weather during the past month has been more favourable than previously; but I am afraid is too late for mealies, which in most parts of the district are stunted. Beans have been largely sown and look well Stock of all kinds is in good condition and with the exception of a little scab amongst horses, free from disease

Tabankulu.—Fine rains fell on the last two days of the month, which, I trust, will be the means of saving the mealie crop, which, however, is very backward. The millet crops will be very small, as also that of tobacco. Stock are healthy and in good condition.

Tsomo.—Fair rains fell during the month; pasturage has in consequence improved, and with it the condition of stock. The natives, owing to the previous drought, are planting mainly forage and beans. A fair mealie crop is not now to be hoped for. No locusts.

Umtata.—During the past month excessive hot days have prevailed, with little or no rain. The prospects of the district from an agricultural point of view have not improved, and we can now hope for a very small mealie crop, and that only from the lands immediately surrounding the mountains which border the district Apart from the results of poor pasturage cattle are healthy and free from disease.

Willowvale.—Stock is in good condition. The value is not altered. No diseases reported during the month. During the month about three inches rain fell. The pasturage is in good condition; but rains fell too late to be of any use to the grain crops, which, I fear, will be a failure. The whole of the fruit crop is an utter failure.

NOTES ON THE WEATHER OF JANUARY, 1905

BY CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

Unusually warm weather, pressure higher than the average, daily thunderstorms, moderately cloudy skies, and a rainfall little more than half the normal, were the leading features of the weather of January last.

Precipitation,—The mean precipitation during January as shown by a total of 352 rain gauges, amounted to only 1·33 ins. falling on 5 days, being 1·14 ins., or 46 per cent. below the average, thus showing a continuation of the already very serious drought. A comparison of the annexed Table with that for December, however, shows that there has been a satisfactory increase in the quantity of the rainfall registered over the Northern Karoo, the North East, Kaffraria, Basutoland, and Orange River Colony, amounting to a practical break-up of the drought over, at least, a large proportion of this area; the rainfall over these parts of the country having been very irregularly distributed and largely local. This table further shows that the mean precipitation over the rainfall divisions is seriously below the average, except in Kaffraria where it is 20 per cent. above the normal. Absolutely no rain fell at any of the stations in the Southern Karoo, and at only three in the West Central Karoo; indeed absolute drought prevailed at two or more stations in divisions II. to X. It is noteworthy that this is the first occasion for 12 years that no rain has been recorded at the Zwartberg Pass. On analysing the totals for the month, it is found that absolute drought prevailed throughout the month at 51 stations; while 142 stations had totals of 1 inch or less; 79 had between 1 and 2 ins., 32 had 2-3 ins.; 16 had 3-4 ins.; 11 between 4 and 5 ins; 3 between 5 and 6 ins.; 4 between 6 and 7 ins.; while 2 each had totals between 7-8,

Division.	Mean Rainfall. (1905).	Mean No. of Days.	Average Rainfall (1894-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
Cape Peninsula ..	0·77	5	1·74	5	– 0·97	– 56
South West ..	0·43	1	1·12	4	,, 0·69	,, 62
West Coast ..	0·09	1	0·41	2	,, 0·32	,, 78
South Coast ..	0·65	4	2·06	7	,, 1·41	,, 68
Southern Karoo ..	0·00	0	0·93	3	,, 0·93	,, 100
West Central Karoo ..	0·02	1	1·07	3	,, 1·05	,, 98
East Central Karoo ..	0·18	1	1·68	4	,, 1·50	,, 89
Northern Karoo ..	1·07	3	1·57	4	,, 0·50	,, 32
Northern Border ..	0·88	3	2·09	5	,, 1·21	,, 59
South-East ..	1·00	6	3·12	9	,, 2·12	,, 68
North-East ..	2·41	7	3·34	8	,, 0·93	,, 28
Kaffraria	4·63	13	3·86	11	+ 0·77	+ 20
Basutoland ..	5·71	11	..	..		..
Orange River Colony ..	3·65	12	..	..	..	..
Durban (Natal) ..	4·44	12	4·74	..	- 0·30	- 6
Bechuanaland	2·44	8	4·33	8	,, 1·89	,, 44
Rhodesia .. .	2·05	6	..	..	..	..

8-9, and 9-10 ins.; the largest amount recorded being 13·73 ins., at Insikeni, the next being Qacha's Nek with 9·[illegible]1 ins. An examination of the Maximum amounts recorded in 24 hours shews that at only 51 stations did this exceed 1 inch; excluding those with "Nil." 246 had 1 inch or less, 44 (mostly situated in North East Kaffraria) had between 1 and 2 ins: while at 5 stations the maximum amount was between 2 and 3 ins.; the two heaviest falls being 3·40 ins, at Fraserburg where this amount was recorded during a Thunderstorm which lasted from 5·50 p m to 9.40 p.m. on the 13th, the dams being filled to overflowing, the next largest amount being 3·23 ins. in 7 hours, on the 23rd at Qacha's Nek.

Thunderstorms, were of daily occurrence at one or more places, being reported from altogether 501 stations, most generally on the 1st, 12th-13th, 19th-20th, and 29th-30th, and it was in connection with these storms that the heaviest precipitation occurred. *Hail* fell at 55 stations on 21 days, chiefly the 23rd and 29th, although one of the most destructive occurred on the 20th in the district of Kokstad, where only 0·18 in was recorded between 2.30 and 3 p.m.: the observer's note on this storm runs as follows:—20th. Terrific storm with hail in part of district, farm houses inundated, some having 3 feet of water in the rooms; crops washed away: fencing destroyed and many sheep drowned, 103 on one farm." No *Snow* or *Sleet* was reported during the month.

Temperature, Cloud and Wind.—The mean monthly temperature of all stations was 71·1°, being 4·1° warmer than December and 1·4° higher than January, 1904: the mean maximum being 82·5° and the mean minimum 59·8°, shewing a mean daily range of 22·7°. The mean daily range during the month varied between 10·3° at Cape Agulhas and 34·1° at Kimberley.

The mean monthly temperature was everywhere above the average, being less than one degree along the coast and increasing to over 3 degrees at East London; this excessive temperature was mainly due to the day temperatures being considerably higher than usual, although the night temperatures were also above the normal but not to the same extent, except in the Central and Northern Karoos. The mean warmest station was Kenhardt with a monthly temperature of 81·0°, while the mean coolest station was Disa Head (Table Mountain) with 60·4°.

The highest mean maximum of 97·1° occurred at Kenhardt and the lowest mean minimum at Disa Head, where it averaged 53·7°. The warmest days were most generally those between the 16th and 19th, while the coolest nights mostly occurred between the 9th and 14th, although the minimum was registered at a few stations at the end of the month. The mean of the absolute maxima for the month amounted to 96·5° and of the corresponding minima to 52·5°, giving a mean monthly range of 44°. The extreme temperatures for the month were 109·0° at Robertson on the 7th and 46·0° on the 14th at Ceres, giving an extreme monthly range of 63·0° throughout all the stations.

The mean percentage of sky obscured by cloud during the month was 14, or 1 per cent more than last month and 7 per cent less than in January. 1904. It was mostly between 55 per cent and 65 per cent along the coasts and in the South-East, decreasing to 30 per cent. in the North East, to 20 per cent. over the Karoo but rising to 58 per cent at Kimberley and 46 at Hopefountain. It was greatest (82 per cent) at Port St. John's, and least (14 per cent.) at Kenhardt and Wagenaar's Kraal. *Fogs* or *mists* were reported daily from altogether 130 stations, except on the 19th, and were most general on the 12th and 13th.

The prevailing *Winds* were, generally speaking, Southerly to South-Easterly over the South-West, Westerly along the Coasts to East London; N to N.-Westerly over Kaffraria, and N.E. or S E in the interior and at Durban, with frequent calms. The mean wind-force for the month was 19·6 on the Beaufort Scale, corresponding to a velocity of 12·8 miles per hour or 1·8 miles per hour less than in December. *Dust Storms* were experienced at 12 stations on 6 days, chiefly on the 2th; *Hot Winds* on 2 days at 2 stations and the wind rose to the strength of a gale at 2 stations on 2 days.

The Isobar of 29·98 ins. ran practically parallel with the South Coast and pressure decreased Northwards.

A fair idea of the state of the country at the close of the month is given in the following notes:—

OBSERVERS' NOTES.

GREAT BRAK RIVER.—Garden crops to great extent failure, owing to drought.

DUNEDIN.—The pasturage in our district being quite exhausted, and rain having fallen in parts of the Carnarvon and Fraserburg districts, all the "trek" sheep have left, going in those directions.

NELSPOORT —Prevailing wind—South. Drought severe. Stock in low condition.

ZWARTBERG PASS.—This is the first time for 18 years that there has been no rain for a whole month.

Corndale.—Very hot days and nights cool, with S.E. wind.

Boschfontein.—Prevailing winds N.W. Drought unbroken. Voetganger locusts again hatched out. Fliers also about, but did little damage.

Vosburg.—The weather during the month has been very hot and oppressive. In very few places is the veld showing any appearance of growth and most of the farmers are looking for somewhere that they can get grazing for their herds. Farmers are having the greatest difficulty in watering their flocks.

Waverley (formerly Kleinhaasfontein). -This unparalleled drought continues. Country in a deplorable state, denuded of stock. Orchards and plantations dying and dead.

Van Wijk's Vlei.—Corn crop bad. Weather promising for rain. Veld poor and water very scarce.

Alexandria.—No crops except mealies, which are in a bad condition owing to drought.

Lynedoch.—Constant winds from S.W., S. and S.E. Evenings cool, days hot.

Stutterheim.—Country still very dry. Stock doing fairly well under the circumstances.

Carnarvon Farm.—Windy days, 5; cloudless days, 1. Though 3·33 inches of rain fell, it is a dry January throughout the country. Country green now, and locusts apparently gone; locust birds plentiful.

Halseton.—Warm weather generally prevailed with the showers during the month, helping the grass. What was a fortnight ago a barren brown waste is now a lovely green.

Keilands.—Drought continues; prospect of harvest almost nil.

Table Hill.—A violent hailstorm on the 1st killed 700 sheep on Monard and Killarney farms.

Thibet Park.—Severest drought ever known. Kei River stagnant for 9 months. No grass, no water. Stock being artificially fed at end of January—a state of affairs never before experienced.

Somerville.—Crops made much progress this month, and promising well. Owing to late rains, a good deal of land unploughed. Natives sowing beans instead of maize.

Fort Rixon.—Worst drought known in this district, no grass, and crops all dried up.

Groot Drakenstein. Driest January since 1894 and warmest since records have been kept (7 years). Maximum temperature 5·3° above that of last month (December, 1904). Almost incessant wind, especially afternoon and night. Country much dried up in conseqeunce. All small streams have ceased running.

Graaff-Reinet.—Drought very bad in district.

Mount Ayliff. -River now very full. Crops are backward, but with favourable weather there may be yet a fair harvest.

TEMPERATURE, JANUARY, 1905

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Devil's Peak	72·1	57·5	64·8	94·0	16	51·0	10
Simon's Town	78·9	64·0	71·4	92·0	16	58·3	10
Sea Point	77·9	60·3	69·1	98·5	17	54·5	5
Wynberg	77·6	60·5	69·1	95·5	16	53·5	20
S A College	80·7	61·0	70·8	102·0	16	54·0	12
Groot Constantia	75·6	58·5	67·1	96·0	17	52·0	21
Disa Head	67·2	53·7	60·4	90·0	16	49·8	20
Blaauwberg	73·1	58·9	66·0	88·0	16	54·0	5 & 10
Elsenburg	80·4	55·4	67·9	99·9	16	47·3	2
Groot Drakenstein	85·7	60·7	73·2	104·3	16	51·1	6
Robertson (Plantation)	89·9	62·9	76·4	109·0	17	52·0	13
Ceres	87·9	55·7	71·8	103·0	16	46·0	14
O'okiep	85·5	57·5	71·5	97·0	16	49·0	13
Storms River	77·2	56·9	67·1	100·0	17	52·0	9 & 12
Cape St Francis	74·9	64·4	69·6	82·0	17	56·0	12
George (Plantation)	75·2	58·8	67·0	91·3	17	54·0	22
Concordia	76·7	59·3	68·0	98·8	17	53·9	21
Van Staaden's River	78·1	59·7	68·9	101·3	17	54·0	10
Heidelberg	86·2	60·3	73·2	102·0	16	53·0	11
Cape L'Agulhas	72·5	63·2	68·4	77·0	18, 28	58·0	8,10,22
Port Elizabeth	75·7	64·5	70·1	81·0	17	58·0	8
Amalienstein	91·2	60·2	75·7	104·0	17	49·0	10
Graaff Reinet	91·4	60·5	75·9	105·2	18	48·0	1
Wagenaar's Kraal	88·4	57·6	73·0	97·0	3, 28	49·0	10
Murraysburg	89·4	59·5	74·5	99·0	3	51·0	9
Hope Town	94·8	63·3	79·0	99·2	3	53·0	10
Kenhardt	97·1	64·9	81·0	105·0	23	56·0	10
Kimberley	95·2	61·1	78·2	102·0	22	54·0	10 & 14
Grahamstown	81·9	57·0	69·4	99·0	17	46·8	31
East London	76·5	65·3	70·9	81·0	24	60·0	7
Stutterheim	81·3	58·2	69·7	98·5	19	48·5	30
Sydney's Hope	81·1	58·4	69·8	98·9	17	52·9	13
Bedford	87·4	58·5	72·9	106·5	20	48·0	26
Rietfontein (Aliwal North)	83·7	56·6	70·2	99·1	7	51·0	31
Aliwal North	85·7	58·3	72·0	92·5	6	52·0	11
Doornkop	83·3	56·3	69·8	91·2	12	49·8	1
Queenstown	88·0	59·6	73·8	101·0	19	52·0	31
Mount Ayliff	83·4	59·9	71·6	98·0	19	54·0	30
Main	81·2	59·3	70·3	98·1	19	51·2	3
Umtata	82·5	61·4	71·9	102·0	19	56·0	16
Port St. John's	79·3	66·6	72·9	86·0	1, 5	60·0	16
Matatiele	81·9	57·0	69·4	92·0	7	53·2	11
Kuruman	89·2	59·4	74·3	96·0	25	51·0	14
Hope Fountain	84·4	60·5	72·4	93·0	7	51·8	1
Means	82·5	59·8	71·1	96·5	..	52·5	..
Extremes	..	..	..	109·0	17	46·0	14

RAINFALL, JANUARY, 1905.

I. CAPE PENINSULA:

	INCHES
Royal Observatory, (a) 12 inch	0·60
Cape Town, Town House	0·59
Do South African College	0·65
Do Sea Point (Hall)	0·45
Do do. (Attridge)	0·42
Do Molteno Reservoir	0·75
Do Platteklip	0·90
Do Signal Hill	0·47
Table Mountain, Disa Head	0·75
Do Kasteel's Poort	0 93
Do Waai Kopje	1·92
Do St Michael's	1·45
Devil's Peak, Block House	1·44
Do Nursery Gauge	1·58
Do Lower Gauge	1·54
Kenilworth	0 36
Wynberg (St. Mary's)	0 45
Groot Constantia	0·68
Tokai	0 37
Simon's Town (Wood)	0·81
Do. (Gaol)	0·86
Blaauwberg Strand	0·34
Robben Island	0·44
Camp's Bay	0·61
Fish Hoek	0·29
Cape Point	0·19
Woodstock	1·06

II. SOUTH-WEST:

	INCHES
Eerste Rivier	0·50
Klapmuts	0·37
Stellenbosch (Gaol)	0·15
Somerset West	0·90
Wellington (Gaol)	0·44
Groot Drakenstein	0·21
Tulbagh	0·41
Ceres	0·86
Caledon	0 00
Worcester (Gaol)	0·00
Lady Grey (Afd. Robertson)	0·00
Robertson	0·00
Robertson (Govt Plantation)	0 01
De Hoop (Div. Robertson)	0·00
Rawsonville	0·18
The Oaks	0 15
Danger Point	1 61
Vijgeboom's Rivier	0·16
Elgin Plantation	1·25
Elsenburg Agricultural College	0·28
Roskeen	1·11
Vruchtbaar	0·86

III. WEST COAST:

	INCHES
Klipfontein	0·07
O'okiep	0·04
Springbokfontein (Gaol)	0·00

III WEST COAST—*Continued*

	INCHES
Concordia	0·06
Garies	0·08
Dassen Island	0·10
Malmesbury	0·24
Piquetberg	0·42
Van Rhynsdorp	0·00
Clanwilliam (Gaol)	0·15
Anenous	0·06
Zoutpan	0·07
Wupperthal	0·00

IV. SOUTH COAST:

	INCHES
Cape L'Agulhas	0·36
Bredasdorp	0 05
Swellendam	0 33
Heidelberg	0 33
Riversdale	0·12
Geelbek's Vlei	0·00
Mossel Bay	0·00
George	0·58
Millwood	1·28
Sour Flats	0·91
Concordia	1·30
Knysna	0·66
Buffels Nek	1·38
Harkerville	0·71
Plettenberg Bay	0·50
Blaauwkrantz	1·23
Storm's River	2·14
Witte Els Bosch	2·05
Cape St. Francis	0·28
Potberg	0·21
Witteklip	0·95
Van Staaden's (upper)	0·85
Do. (lower)	0·83
Uitenhage	0·13
Do (Park)	0·12
Port Elizabeth (Harbour)	0·35
Lottering	1·67
Shark's Rivier (Nursery)	0·55
Do (Convict Station)	0·31
Grootvader's Bosch	0·30
Karnmelk's River	0·35
Zuurbraak	1·14
Vogelvlei	0·19
Great Brak River	0·20
Kruis River	0·38
Armadale	0·02
Centlivres	0·00
Woodifield	0·51
George (Plantation)	0·67

V. SOUTHERN KARROO:

	INCHES
Ladismith	0·00
Calitzdorp	0·00
Oudtshoorn	0 00
Uniondale	0·00

V. S. KARROO *continued*	INCHES
Kleinpoort	0·00
Glenconnor	0·00
VI. WEST CENTRAL KARROO	
Prince Albert Road	0·00
Fraserburg Road	0·0
Prince Albert	0·00
Zwartberg Pass	0·00
Beaufort West	0·15
Dunedin	0·00
Nel's Poort	0·00
Camfer's Kraal	0·06
Lower Nel's Poort	0·00
Baaken's Rug	0·06
Willowmore	0·00
Steytlerville	0·00
VII. EAST CENTRAL KARROO:	
Aberdeen (Gaol)	0·09
Aberdeen (Bedford)	0·10
Rietfontein	0·06
Kendrew	0·09
Graaff-Reinet	0·10
Do (College)	0·10
New Bethesda	0·31
Roo de Bloem	0·13
Patrysfontein	0·42
Toegedacht	0·62
Klipfontein	0·55
Cranemere	0·00
Pearston	0·00
Middleton	0·00
Corndale (Div. Aberdeen)	0·07
Cookhouse	0·00
Middelwater	0·00
Darlington	0·00
Buffels Kloof	0·49
Glen Harry	0·19
Bloemhof	0·20
Roode Hoogte	0·96
Walsingham	0·00
Arundale	0·05
VIII. NORTHERN KARROO:	
Sutherland	0·00
Fraserburg	3·40
Carnarvon	0·85
Wagenaar's Kraal	0·00
Brakfontein	0·00
Victoria West	0·10
Britstown	1·00
Murraysburg	0·56
De Kruis	0·63
De Aar	0·88
Middlemount	1·12
Philip's Town	1·90
Boschfontein	1·11
Petrusville	0·68
The Willows	0·85
Middelburg	1·49
Colesberg	1·50
Tafelberg Hall	0·94
Cradock	0·93
Do. (D/E Office)	1·14
Witmoss	0·56

VIII. N KARROO—*continued*	INCHES
Steynsburg	4·81
Quagga's Kerk	0·65
Tarkastad	1·55
Riet Vlei	0·74
Omdraai's Vlei	0·83
Varken's Kop	1·78
Culmstock	1·70
Doorskuilen	0·74
Hillmoor	1·80
Glen Roy	0·52
Fish River	1·10
Loxton	0·70
Waverley	1·63
Scorpions Drift	0·00
Wildebeestkooij	1·45
Maraisburg	1·15
Montagu	1·07
Rietfontein (Cradock)	0·49
Schuilhoek	1·18
Vosburg	0·58
Zwavelfontein	0·67
IX. NORTHERN BORDER:	
Pella	0·04
Kenhardt	0·04
Van Wyk's Vlei	0·04
Prieska	1·12
Dunmurry	0·35
Griqua Town	0·77
Campbell	1·44
Douglas	2·27
Hopetown	0·80
Orange River	0·65
Newlands (Div Barkly West)	1·95
Kimberley (Gaol)	1·31
Do. (Stephens)	1·19
Barkly West	1·59
Upington	0·01
Trooilapspan	0·00
The Halt	0·00
New Year's Kraal	1·41
Karree Kloof	1·71
X. SOUTH-EAST:	
Melrose	0·37
Fairholt	0·51
Cheviot Fells (Bedford)	0·51
Bedford (Gaol)	1·12
Sydney's Hope	0·31
Adelaide	0·29
Atherstone	0·64
Alexandria	0·54
Salem	0·25
Graham's Town (Gaol)	0·52
Do. (Bact. Inst.)	0·56
Heatherton Towers (near Graham's Town)	0·00
Fort Beaufort	0·41
Katberg	2·68
Seymour	0·40
Glencairn	1·01
Alice	0·00
Port Alfred	0·58
Hogsback	0·32
Thaba N'doda	0·65

X. SOUTH-EAST—*Continued*	INCHES
Peddie	0·61
Cathcart	1 51
Keiskama Hoek	0 41
Crawley	1·55
Thomas River	1·22
King William's Town	0·40
Stutterheim (Wylde)	1·13
Do (Besté)	1·10
Dohne	1·63
Daggaboer	0·36
Albertvale	0·33
Kubusie	0 90
Blaney	0·35
Kei Road	1·61
Evelyn Valley	3 44
Berlin	0·00
Isidenge	1·53
Perie Forest	1·62
Quacu Forest	1·66
Kologha	1·94
Fort Jackson	0·00
Komgha	1 61
Prospect Farm (Div Komgha)	1·11
East London, West	1·41
Do East	1·43
Bolo	0·86
Fort Fordyce	1·20
Lynedoch	0·00
Sunnyside	0·43
Forestbourne	2 19
Chiselhurst	1·55
Cata	2·16
Wolf Ridge	2·38
Dontsah	1·60
Mount Coke	0 00
Blackwoods	0·73

XI. NORTH-EAST:	
Venterstad	1·20
Ellesmere	2 11
Burgersdorp	2 80
Molteno Station	1·76
Cyphergat	2·30
Thibet Park	0·91
Sterkstroom	2·02
Do (Station)	1·70
Rocklands	0·50
Rietfontein	2·66
Hex's Plantation	0·84
Carnarvon Farm	3·33
Jamestown	2 02
Queenstown (Gaol)	1 72
Do. (Beswick)	2·08
Herschel	2·96
Lady Grey	2·35
Bolotwa, Contest	2·58
Lady Frere	4·02
Avoca (Div Barkly East	2·28
Barkly East	2·44
Lyndene	2·88
Poplar Grove	0·93
Whittlesea	2·12
Halseton	3·20
Sterkspruit	2·42
Doornkop	6·65
Blikana	4·99

X. NORTH-EAST—*continued*	INCHES
Table Hill	4·52
Albert Junction	1·74
Hughenden	1·67
Glen Wallace	3·02

XII. KAFFRARIA:	
Slaate, Xalanga	5 46
Ida, Xalanga	5·69
Cofimvaba	1·67
Nqamakwe	1·85
Main	2·32
Engcobo	1·72
Butterworth	2·21
Kentani	3·64
Maclear	8·13
Idutywa	1·74
Willowvale	3·57
Mount Fletcher	6·88
Elliotdale	3·28
Mqanduli	3·17
Matatiele	7·23
Umtata	2·09
Kokstad	5·73
Port St. John's	4·52
Umzimkulu	3·93
Tabankulu	3·29
Somerville (Div. Tsolo)	4·12
Tsomo	1·51
Bazeya	9·11
Qwebe	4·72
Mount Ayliff	2·73
Seteba	6·66
Flagstaff	3·44
Insikeni	13·73
Wanstead	8·13
Cedarville	6·53

XIII BASUTOLAND:	
Mafeteng	4·20
Mohale's Hoek	2·88
Qacha's Nek	9·71
Moyeni Quthing	7·20
Maseru	4·54

XIV. ORANGE RIVER COLONY:	
Kroonstad	1·46
Imperani	4·90
Fairfield	4·78
Zuikerkop	3·47

XV. NATAL	
Durban, Observatory	4·44

XVII. BECHUANALAND:	
Vryburg	1·10
Mafeking	1·81
Taungs	3·97
Setlagoli	2·16
Kuruman	2·93
Zwartlaagte	2·68

XVIII. RHODESIA:	
Geelong	2·56
Matopo Park	3·28
The Range	3·13
Fort Rixon	0·68
Gwanda	0·59

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 18th February 1905, ruling at the several centres named, is published for general information:—

CENTRE.	A	B	C.	D.	E.	F.	G.	H	J.	K	L	M.	N.	O.	P	Q.
	Wheat per 100 lb.	Wheat Flour per 100 lb	Boer Meal per 100 lb.	Mealies per 100 lb	Mealie Meal per 100 lb.	Barley per 100 lb.	Oats per 100 lb.	Oat-hay per 100 lb	Potatoes per 100 lbs.	Tobacco (Boer Roll) per lb.	Beef per lb	Mutton per lb	Fresh Butter per lb	Eggs per doz	Cattle (Slaughter)	Sheep (Slaughter.
	£ s d	£ s d	£ s d	£ s. d	£ s d	£ s. d.	£ s d.	£ s. d	£ s. d.	£ s d	s d	s d	£ s 1	s d		
Aliwal North ...	0 12 0	0 14 0	0 13 6	0 7 6	0 9 0	0 10 0	0 9 0	0 7 6	0 9 0	1/6 to 4/-	0 9	0 9	0 2 0	2 0	£13 10s	24/-
Beaufort West	0 11 6	0 17 0	0 13 0	0 9 0	0 12 6	0 10 0	0 8 0	0 4 6	0 5 0	0 0 7	6d to 11d	0 7½	0 1 9	1 6	£18	25/6
Burghersdorp	..	...	...	...	...	...	...	0 7 3	0 9 0	...	. .	0 8½	0 1 3	2 0	.	...
Cape Town ...	0 9 9	0 12 4	0 10 0	0 6 9	0 8 3	0 5 4	0 5 0	0 3 3	0 5 0	0 0 8	0 10	0 10	0 1 3	2 0	£16 to £20	25/-
Clanwilliam	0 10 6	1 5 0	0 14 0	0 10 0	..	0 10 0	0 8 0	...	0 12 6	0 4 6	0 8	0 7	0 1 6	1 0		..
Colesberg	...	...	...	...	...	...	. .	...	0 8 6	...	...	0 7	0 1 0	1 9	.	..
Cradock	...	...	...	...	.	0 8 9	...	0 8 0	0 10 0	. .		0 9	0 2 0	2 3		..
Dordrecht	0 12 0	0 16 0	0 14 0	0 10 0	0 11 0	0 15 0	0 12 0	0 9 0	0 10 0	0 1 0	0 10	9	0 1 3	2 6	£12	22/6
East London ..	0 13 0	0 15 6	0 13 0	0 7 6	0 10 6	0 9 0	0 11 6	0 7 0	0 12 6	0 1 6	1 1	1	0 1 6	2 6	£22	35/-
Graaff-Reinet	0 10 0	...	..	0 8 6	...	0 8 6	...	...	0 14 0	0 0 4	0 6	7	0 1 6	1 6	£10	18/
Graham's Town	0 9 0	...	...	0 8 0		0 7 6	...	0 5 8	0 11 6	.	0 9¼	0 9	0 2 9	2 0		...
Kimberley ..	0 11 0	0 15 6	0 14 0	0 7 0	0 7 6	0 7 0	0 7 0	0 5 6	0 17 6	0 0 6	0 10	0 8	0 1 9	1 9	£12 to £15	23/- to 26 -
King Wm's Town	0 9 0	0 15 0	0 13 0	0 7 6	0 8 6	0 12 0	0 9 0	0 7 0	0 12 6	0 0 6	0 9	0 9	0 1 9	1 6		. .
Malmesbury .	0 8 6	0 12 6	0 10 6	0 6 3	...	0 7 6	0 7 5	0 3 0	0 8 4	0 1 0	0 9	0 9	0 1 3	1 6	£16	24/-
Mossel Bay ...	0 10 0	0 15 0	0 18 0	0 8 0	...	0 6 0	0 6 0	0 2 6	0 8 0	0 1 0	0 8	0 9	0 1 9	1 0	...	...
Port Alfred ..	0 12 0	0 18 0	0 14 0	0 11 0	0 11 0	0 8 0	0 8 0	0 3 0	0 6 0	0 0 9	0 10	0 10	0 2 3	1 6	.	
Port Elizabeth ...	...	...	..	0 7 6	...	0 5 6	...	0 3 6	0 9 0	.		.	0 2 3	2 4		.
Queen's Town ...	0 8 0	0 12 0	0 11 6	0 6 6	0 8 3	0 7 6	0 6 9	0 6 0	0 10 0	0 2 0	0 9	0 7	0 1 6	2 6	£15	23/-to 26/-
Tarkastad	0 12 0	0 13 6	0 12 6	0 12 0	0 12 0	0 11 0	..	0 8 6	0 10 0	0 1 6	8	8	0 2 6	1 6	£15	20/-
Vryburg	0 18 6	0 18 6	0 15 0	0 7 6	0 10 0	0 11 0	0 7 0	0 6 0	0 8 0	0 1 0	0 10	0 9	0 1 9	1 0	£17 10s.	27 6
Worcester ...	0 9 0	0 15 0	0 11 3	0 9 0	0 10 0	0 6 0	0 6 0	0 3 6	0 5 6	0 0 9	0 8	0 8	0 1 6	1 0	.	

NOTE.—A blank space denotes "no transactions.'

DEPARTMENTAL NOTICES.

Quarantine Regulations for Cattle and Sheep Introduced from Argentina, &c.

The following Regulations framed under the Animals Diseases Act have been gazetted by Proclamation No. 408, 1904, to apply to the introduction and importation into the Colony of Cattle and Sheep from Argentina, Uruguay, &c.:—

1. For the purpose of these regulations the term "Stock" shall be held to mean horned cattle, sheep and goats.

2. The importation will be allowed only through the port of *Cape Town.*

3 The stock on arrival at the Port shall be inspected by a Government Veterinary Surgeon, and, if passed, shall be permitted to be landed, under the supervision of a Harbour Board Officer, and at the risk and expense of the importer, into sheds at the South Arm, Alfred Docks, where it will be quarantined for a period of four days, at the importer's expense.

4. All stock so landed must be accompanied by a Certificate in the subjoined form "A."

5. All Cattle so landed must in addition, be accompanied by a Certificate in the subjoined form "B," and, unless intended for immediate slaughter, by a further certificate in the form "C."

6. All cattle not intended for immediate slaughter, and unaccompanied by such certificate "C" may, nevertheless, be landed, but must be submitted to the *Tuberculin* test at the Quarantine Station, and any which re-act thereto shall be slaughtered forthwith.

7. Should any appearance of infectious or contagious disease be discovered by the Veterinary Inspector amongst the live-stock on board any vessel on her arrival in the Bay, such live-stock will not be allowed to be landed alive, but must be slaughtered on board either the same vessel or any other vessel to which it may be permitted to be transferred The carcases, however, after being properly dressed on board and after the removal of any affected organs, such as the heads and feet, may be allowed to be landed. The offal and all diseased parts or organs must be taken out to sea, properly weighted under the direction of a Harbour Board Officer, and thrown overboard at a spot indicated by the Port Authorities.

The hides and skins of all stock slaughtered in the Bay will not be allowed to be landed, until they are disinfected to the satisfaction of the Government Veterinary Surgeon.

No litter, manure, or hay of any kind, shall be thrown overboard in the Bay; these articles must be either consumed by fire on board or taken out to sea and disposed of in the same manner as the offal, &c.

8. No loose hay, or hay stored on deck, shall be allowed to be landed from any vessel carrying live-stock amongst which any infectious disease has appeared; but hay properly baled and stored in closed hatches which have not been opened during the voyage may be allowed to be landed, if the Veterinary Surgeon is satisfied that there has been no communication between such closed hatches and the other parts of the vessel during the voyage.

9. Should any appearance of an infectious or contagious disease manifest itself at any time amongst such imported live-stock while in quarantine, the whole consignment must be slaughtered forthwith in the sheds provided for the purpose, and the diseased organs, offal, blood, manure litter, hay, &c., disposed of in the manner set forth in paragraph 7.

10. After each day's slaughtering the importer must clean up the slaughter-house, and place all hides, offal, fat, etc., in the proper receptacles for their removal, to the satisfaction of the Government Officer.

11. All carcases must be removed from the cooling-room, together with all hides offal, fat, etc., within 15 hours of the termination of each day's slaughtering.

12. Should no indication of disease be discovered amongst such stock during the period of quarantine, they shall be exempt from further detention, and may be removed by rail, to any place within the Colony

13. All slaughter stock intended for removal from the Station shall be branded with a Government mark S, to signify that it is intended for slaughter only.

14. All provender shall be supplied by the importer, and stock in pens in quarantine, or awaiting slaughter, is to be fed and watered by the importer, who must also arrange for the cleansing of the pens and the removal of all offal, etc., into trucks, at the close of each day, to the satisfaction of the Officer appointed by Government.

15. All loading of stock from the pens to the train must be performed by the importer.

16. The importer will be required to pay the Dock dues, &c., imposed by the Table Bay Harbour Board and, in addition, a special charge of 1s. 6d. per head for Horned Cattle, and 3d. per head for Sheep and Goats landed into the sheds at the Quarantine Station.

CERTIFICATE "A."

I do hereby certify that the undermentioned Stock is free from disease, and has come from an area which is free from Epizootic Aphtha (Foot and Mouth Disease), and also from other contagious or infectious disease of Stock.

Number and general description of Stock ....
Place from which Stock has come ....
Name of Consignee ....

Signature........................
Title........................
Place........................

Date....................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the Stock is shipped.

CERTIFICATE "B."

I do hereby certify that the undermentioned cattle are free from disease, and have not come from a locality in which the disease known as Redwater, Texas Fever, Tick Fever or Tristeza is indigenous, and in which healthy cattle from non-infected areas are liable to become infected with the said disease.

Number and general description of the Cattle..
Place from which Cattle have come ....
Name of Consignee ....

Signature........................
Title........................
Place........................

Date....................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the cattle are shipped.

CERTIFICATE "C."

I hereby certify that the undermentioned cattle, branded with the sign T, have been submitted by me to the Tuberculin Test, and, not having re-acted thereto, I consider them free from Tuberculosis.

Number and general description of Cattle ....
Place from which Cattle have come ....
Name of Consignee ....

Signature........................
Title........................
Place........................

Date....................

To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the Country from which the cattle are shipped.

Railway Rebate upon Carriage of Cement, &c., used in Sheep or Cattle Dipping Tanks.

It is hereby notified that from and after December 24, 1904, and until further notice, a rebate will be given, under the following conditions, upon the carriage paid for cement, &c., carried over the Cape Government Railways, and used in the construction of sheep and cattle dipping tanks.

CONDITIONS.

1. The whole of the material comprised in any consignment must be employed solely for sheep or cattle dipping tanks

2. Rebate will be payable only after presentation of a certificate in the annexed Form A, declared to by the applicant in the presence of the Resident Magistrate of the Fiscal Division within which the dipping tank is situated.

3. The rebate will be applicable only to cement and such other materials as may in the discretion of the Government be admitted from time to time as necessary for the construction or enlargement of any dipping tank.

4. The rebate under these Regulations will be the difference between the South African produce rates (classified "C") and the normal or ordinary Cape Government Railway rates as specified from time to time in the Railway Tariff Book for the carriage of the materials above specified, and of such additional items as may hereafter be added.

5 Applications for rebate must be addressed to the Under Secretary for Agriculture, accompanied by the Railway receipts for carriage paid and by the required declaration on Form A.

6. For facilitation of the subsequent adjustment of any applications under these Regulations, it is recommended that consignors should hand in at the despatching station Consignment Advice Notes on Form B.

7. The Government reserves to itself the right of accepting or declining to admit any application under these Regulations, but no application shall be admitted when the applicant is the recipient of other aid from Government in respect to the construction of dipping tanks, and any decision in this respect must be accepted as final.

8. Copies of these Regulations and of the Forms A and B will be obtainable from all Civil Commissioners or from the Agricultural Department.

FORM A.

REBATE OF RAILWAY CARRIAGE UPON CEMENT, ETC., USED FOR SHEEP OR CATTLE DIPPING TANKS.

APPLICANT'S DECLARATION.

Division of

I,

of

Ward Division

hereby certify and solemnly and sincerely declare that I am not the recipient of any Government aid, either directly or indirectly, in the construction of Dipping Tanks, and that all the materials specified in the accompanying railway receipt (or receipts) for carriage paid have been actually used in the construction of the dipping tanks described below, and that they are permanently embodied therein; that the tanks have been constructed solely for the purpose of dipping sheep or cattle, and that I have no intention of removing any of the said materials for use elsewhere I hereby accept and undertake to be fully bound in every respect by the conditions published under Government Notice No. 1366 of 24th December, 1904, and should the Government at any time depute any person for the purpose of making an inspection of the works to which this application applies, I undertake to allow him free access to the work and to all appliances and undertakings connected therewith, and hereby agree to afford him every assistance in determining the manner in which the material has been utilised, and in all other respects to render all reasonable facilities and supply any information required. I make this solemn declaration conscientiously believing the same to be true and correct in all particulars.

Signature of Applicant

Date

Declared before me

this day of 190

Resident Magistrate

DESCRIPTION OF WORK

1 Name of Division in which work is situated

2 Name of Ward in which work is situated

3 Name of Farm on which work is situated

4 Approximate distance of site of work from nearest Railway Station

miles

FORM B

REBATE OF RAILWAY CARRIAGE UPON CEMENT, ETC, USED IN CONSTRUCTION OF SHEEP OR CATTLE DIPPING TANKS

CONSIGNMENT ADVICE NOTE

Under Government Notice No 1366 of
24th December 1904

To the

Please take notice that I have this day consigned from

Station to Station, on account of

of in the Division of

the materials (or articles) specified in the subjoined schedules

Application for rebate under Government Notice No. 1366 of 1904 will be made in respect of this consignment in due course

(State capacity in which consignee is acting,
e g, as Agent, Manufacturer, etc)

Schedule.

Description of Material	Weight	Rate	Total Charges

Inspection of Live Stock arriving by Sea.

Regulations for the inspection of Horses, Cattle, and Pigs arriving from abroad are published for the guidance of both Exporters and Importers, to prevent disappointment upon arrival in this Colony.

HORSES, MULES, OR ASSES (Proclamation No 173 of 1900).—Glanders.—(1) No horses, mules or asses shall be allowed to enter this Colony by sea, until they have been examined by an Officer, authorised by the Government, to make examinations under the provisions of the "Animal Diseases Act, No. 27 of 1893," and certified by him to be free from Glanders, or any other infectious or contagious disease.

(2) Should the Examining Officer detect the presence of Glanders in any of the animals on board, all such infected animals shall be immediately killed, and their carcasses taken out to sea, sufficiently and properly weighted, and thrown overboard at a place indicated by the Port authorities.

(3) The remaining portion of any such shipment shall be allowed to be landed only on condition that they are removed to a quarantine station, approved of by the Government, and there subjected to a test with mallein by a duly qualified Officer, under direction of a Government Veterinary Surgeon, and detained for such further period as may be necessary

(4) In the event of the test indicating the existence of Glanders, all animals so shown to be affected shall also be destroyed.

(5) All expenses of inspection, quarantine, destruction, and otherwise, shall be borne by the owner of such animals.

CATTLE (Proclamation No. 75 of 1900).—Tuberculosis.—1. The word "cattle" in these Regulations shall be taken to mean and include all animals of the bovine tribe.

2. No cattle shall be allowed to enter this Colony by sea until the conditions set forth in these Regulations are complied with.

3. If there shall be produced to the Officer authorised by the Government to make the necessary examination of cattle under the provisions of the Animal Diseases Act No. 27 of 1893, a certificate signed by a duly qualified Veterinary Surgeon of the country from which such animals have been brought, to the effect that they have, before being embarked, been submitted to the test known as the tuberculin test, and have not given any reaction indicative of the presence of tuberculosis, and if upon examination the Government Officer shall have reason to believe that they are free from any contagious or infectious disease he shall forthwith give a permit for their landing at any port or place in this Colony.

4. In the absence of a satisfactory certificate as aforesaid the cattle shall be removed to a place provided by the Government for quarantine purposes, and shall be subjected by a Government Veterinary Surgeon to the necessary testing by tuberculin to ascertain whether they are or are not affected with tuberculosis.

5. In the event of the test indicating the existence of Tuberculosis, the animals shall not be removed alive from the quarantine station but shall be destroyed there, and the owner shall be allowed to deal with the carcasses as he may think fit, provided, however, that the flesh shall not be used for human consumption unless the said officer gives a certificate that it is fit for that purpose.

6. All expenses of inspection, quarantine, destruction, and otherwise shall be borne by the owner of such cattle.

7. The foregoing Regulations shall not apply to cattle entering by sea from the Colony of Natal, so long as similar regulations remain in force in that Colony, nor shall they apply to cattle imported solely for purposes of slaughter, provided that, before being landed, they shall be inspected by the officer referred to in the third section of these Regulations and declared to the best of his belief to be not unfit for human consumption, and the owner or importer shall sign and deliver to such officer an undertaking to the effect that none of such animals shall be used or disposed of for any other purpose than for *immediate* slaughter for food.

PIGS (Proclamation 214 of 1903).—The importation of pigs referred to in this Proclamation shall be permitted only upon the following conditions being complied with, namely:—

(a) Before shipment every owner shall obtain a Certificate from a duly qualified Veterinary Surgeon, setting forth that at the time of shipment the pigs are apparently free from the appearance of any contagious or infectious disease.

(b) The consignor shall sign a declaration on oath before a competent legal authority in the country from which export is to take place, to the effect that the pigs have been on the premises from which they are removed, prior to being moved for shipment, for at least 14 days, and that during such period no other pig has been introduced or received into or upon such premises, that the pigs are not affected with swine-fever, that they are not moved out of a swine-fever infected place or area, and further that the movement is not prohibited by any provision of law then in force in the country, state or territory from which such movement takes place.

(c) The Certificate and declaration hereinbefore referred to shall be delivered to any person authorised by the Government of the Colony of the Cape of Good Hope to make the examination required by the "Animal Diseases Act, No. 27 of 1893."

d) Pigs which may arrive at any port or place in this Colony unaccompanied by the abovementioned certificate and declaration, will not be permitted to be landed, except at Cape Town, Port Elizabeth and East London, where arrangements for quarantine exist.

(e) Such quarantine as is in the foregoing section referred to shall not be for a less period than 28 days from the date of embarkation.

f) Pigs, which may be found to be infected with swine-fever on arriving at any Port or place in the Colony, or which have been in contact during the voyage with pigs so affected, shall be dealt with in such manner as the Government may direct.

Regulations for Introduction of Cattle from Orange River Colony.

The following proclamation No. 217 of 1903 is published by command of H.E. the Governor.

Under and by virtue of the powers and authorities in me vested by the "Animal Diseases Act," No. 27 of 1893, and by the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare, and make known that, notwithstanding anything contained in Proclamation No. 139, bearing date the 15th day of August, 1901, it shall and may be lawful, from and after the date hereof, to introduce horned cattle into this Colony from the Orange River Colony, subject to the Regulations contained in the Schedule hereto.

Schedule to foregoing Proclamation.

(1) The person in charge of the horned cattle introduced under this Proclamation shall obtain and have in his possession a certificate in the form set forth in Annexure

"A" hereto, issued and signed by the Resident Magistrate or Special Justice of the Peace of the District in the Orange River Colony from which the cattle have come.

(2) The person in charge of such cattle is liable to be called upon to produce the certificate aforesaid to any Field-cornet, Justice of the Peace, Police Officer, or owner of land over which the cattle may pass or be passing.

(3) Any person who shall contravene any of the provisions of these Regulations shall, upon conviction, be liable to a fine, not exceeding Fifty Pounds Sterling, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding Three Months, unless such fines be sooner paid.

ANNEXURE "A."

I do hereby certify that the undermentioned cattle are free from infectious or contagious disease, and have not been in contact with infected animals, or, to the best of my knowledge and belief, come from or through a locality where any such disease is known to exist, viz.:—

Number and general description of cattle. ....
Place from which sent. ....
Owner's name and address. ....
Name of person in charge. ....
Place in Cape Colony to which cattle are being sent. ....
Signature of Resident Magistrate of District in Orange River Colony from which cattle have come ....
....
....
Place ....
Date ....

Redwater or Texas Fever.

CATTLE FROM QUEENSLAND, UNITED STATES OF AMERICA AND MADAGASCAR.

REGULATIONS REGARDING THE IMPORTATION OF CATTLE FROM QUEENSLAND UNITED STATES OF AMERICA, AND MADAGASCAR.

1. Cattle from the abovementioned Countries may be landed at the Ports of East London, and Port Elizabeth, subject to inspection and issue of Clean Certificate at such port as provided by law.

2. Such Cattle may also be landed at the Ports of Cape Town and Mossel Bay, provided they are accompanied by a Certificate in the subjoined form.

CERTIFICATE.

I do hereby certify that the undermentioned cattle are free from disease, and have not come from a locality in which the disease known as Red Water, Texas Fever, Tick Fever, or Tristeza is indigenous, and in which healthy cattle from non-infected areas are liable to become infected with the said disease.

Number and general description of cattle ....
Place from which cattle have come ....
Name of consignee at Cape Town or Mossel Bay ....
....
* Signature ....
Title ....
Place ....
Date ....

African Coast Fever.

PROHIBITION OF INTRODUCTION OF CATTLE FROM SOUTHERN RHODESIA.

By command of His Excellency the Governor the following Proclamation No. 139 1902, is published.

Whereas the disease known as Redwater is prevalent amongst cattle in Southern Rhodesia:

Now, therefore, I do hereby proclaim, declare and make known that, under and by virtue of the powers vested in me by the said Act No. 27 of 1893, the introduction of cattle from Southern Rhodesia into any part of this Colony shall be and is hereby prohibited, and that all cattle which may enter this Colony in contravention of this Proclamation shall be liable to be destroyed.

And I hereby declare that this Proclamation shall have effect from and after the date hereof, and shall continue in force until amended or repealed.

And I do strictly charge every Resident Magistrate, Field-cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Prohibition and Regulation of the Introduction of Live Stock in consequence of African Coast Fever in the Transvaal.

By proclamation No. 202, dated June 29, 1904, the following is enacted:—

It shall not be lawful, from and after the promulgation hereof, to introduce or cause or allow to be introduced into this Colony from any part of the Transvaal any of the following animals, that is to say:—Cattle, horses, mules, asses, sheep, goats, pigs, ostriches, dogs and cats; provided, however, that horses, mules, asses, dogs and cats, may, with the special permission of the Chief Veterinary Surgeon, or his authorised representative, be so introduced at such ports of entry as may from time to time be appointed for this purpose, if accompanied by a Certificate signed by the Principal Veterinary Surgeon of the Transvaal, or his authorised representative, to the effect that they have not come from or passed through any portion of the Transvaal proclaimed or known to be infected with African Coast Fever.

Any person introducing such animals or causing or allowing such animals to be introduced, or permitting such animals to stray into this Colony from the Transvaal shall be deemed to be guilty of contravening the provisions of the Proclamation and be liable to the penalties provided in Act 28, of 1893 (Animal Diseases Act, 1893); and all such animals entering the Colony from the Transvaal in contravention of the Proclamation are liable to be destroyed.

Rinderpest in Natal.

By proclamation No. 242 of August 5, 1904, the introduction of Horned Cattle from Natal to the Transkeian Territories, including Pondoland, is prohibited owing to the presence of Rinderpest in Natal, except through the following ports of Entry, viz., Riverside Drift, Border Gate, Umzimkulu Drift and Stanford Drift, district of Umzimkulu, and Middle Drift, Pondoland. They must then be accompanied by the following certificate:—

I hereby certify that the undermentioned cattle are free from infectious and contagious disease, and have not been in contact with infected animals or come from a locality where any such disease shall be known to exist.

---

* To be signed by an Officer specially authorised to perform the duty by the Government or State Administration of the country from which the cattle are shipped

Number and general description of cattle and place from which sent..

Owner's name and address...... .. ..
Name of person in charge... ....
Place to which cattle are being sent......... . ...
Signature of Official of Natal Government......... .. . .
Title . ...
Place..................... ....
Date............... .. ..

Any horned cattle introduced in contravention of this proclamation are liable to be destroyed.

Rinderpest.

By command of His Excellency the Governor, the following Proclamation No. 85, of 1903, is published:—

Under and by virtue of the powers in me vested by the "Animal Diseases Act," No. 27 of 1893, and the "Animals Diseases Rinderpest Amendment Act," No. 2 of 1897, I do hereby proclaim, declare and make known that, whereas the disease known as Rinderpest has appeared amongst cattle in the British Bechuanaland Protectorate, it shall not be lawful, from and after the date hereof, to introduce or to cause or allow Horned Cattle to be introduced into this Colony from the British Bechuanaland Protectorate.

And I do hereby further proclaim and make known that all Horned Cattle which may enter this Colony in contravention of the Proclamation shall be liable to be destroyed.

Swine Fever.

In view of the appearance of Infectious Swine Fever the symptoms of the disease are hereunder described for general information.

Any case coming to the notice of the Public should be at once communicated to the Resident Magistrate of the District in which the disease has occurred.

SYMPTOMS.

The symptoms of swine fever are not very distinct or specially characteristic at the commencement of the attack, or even during its course, except in acute cases.

The affected animals present a dull and dejected appearance; they move about very quietly, and manifest a strong tendency to huddle together. If there is loose soil, manure, or litter available, they will crowd together in that.

Their appetite is diminished, and although many of them continue to take a fair amount of food, until they become very bad, they eat in a languid and indifferent manner. Their temperature rises from about 105 to 106 degrees Fahrenheit. In one the temperature registered was 108·4, but it was hustled about a good deal in catching it, which may have raised its temperature a little.

The breathing is slightly quickened, but the increase in the respirations depends upon the extent of the lung lesions. There is also a cough, which is very much aggravated when the pigs are driven about in a kraal In many cases the cough is the first indication of the infection. There is a hoarseness about the voice in advanced cases.

In an acute attack the pigs fall off in condition very rapidly, and manifest a weakness about the hind quarters which makes them walk with a wobbling staggering gait. As the disease advances the listlessness increases and the hind quarters may become semi-paralysed.

The bowels are usually slightly constipated at the commencement, but diarrhœa generally supervenes towards the end.

The progress of the disease is very variable; in some acute cases it runs its course in two or three days, terminating fatally, while in others it may last much longer, but there has not been sufficient time to speak definitely of the course of the disease here yet.

In a number of cases there is more or less of a pink red discolouration of the skin This does not usually occur until the disease is at its height, and in many cases there is no appearance of discolouration of the skin observable. When present the parts most affected are under the surface of the neck, the breast and the abdomen; the inside of the thighs and the ears In acute cases these patches of discolouration extend and coalesce and assume a darker hue, the whole surface of the skin being more or less affected In such cases the skin after death assumes a dark livid hue.

REMOVAL OF SWINE FROM THE DISTRICTS OF CAPE, STELLENBOSCH, PAARL AND MALMESBURY.

By proclamation No 181, of June 10, 1904, swine are allowed to be removed out of he above divisions provided a permit for such removal be first obtained from the Chief Veterinary Surgeon.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice in Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from a contagious or infectious disorder, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and, in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to the Chief Veterinary Surgeon, Cape Town (telegraphic address: "Veterinus," Cape Town), the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the reatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residences or nearest Railway or Post Cart Station.

D. HUTCHEON,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 24th June, 1904.

Stations	*Names of Veterinary Surgeons.*
Aliwal North	H. T. Armstrong, M.R.C.V.S.
Cape Town	W. G. Pakeman, M.R.C.V.S.
,,	S. Elley, M.R.C.V.S.
East London	R. W. Dixon, M.R.C.V.S.
Elsenberg	R. Paine, M.R.C.V.S.
Fort Beaufort	J. F. L. Lyons, M.R.C.V.S.
Grahamstown	T. Bowhill, F.R.C.V.S.
Kokstad	W. A. Hutchence, M.R.C.V.S.
Knysna	J. A. Robinson, M.R.C.V.S.
Malmesbury	C. Goundry, M.R.C.V.S.
Molteno	W. H. Chase, M.R.C.V.S.
Somerset East	J. D. Borthwick, M.R.C.V.S.
,,	J. Spreull, M R.C.V.S.
Uitenhage	G. W. Freer, M.R.C.V.S.
Vryburg	J. Neill, M.R.C.V.S.
Worcester	A. Goodall, M.R.C.V.S

Farmers' Apprentices, Dairy Assistants, &c.

As inquiries are from time to time received from young men from abroad as to where they may serve apprenticeship or gain practical experience of farming in this Colony, before starting on their own account, the Secretary for Agriculture invites Farmers who are willing to receive young men of good character, for this purpose, to register their names with the Under Secretary for Agriculture, stating the class of farming they do, how many young men they are prepared to take, and for what period they would enter into an agreement.

It is not probable that these young men will be in a position to give more than their free services in return for the experience they will gain; that is, they will not be able to pay any fee; and they will look to receiving free board and lodging in return for their services.

Young men who are willing to engage themselves as Farmers' Apprentices in Cape Colony should register their names with the Under Secretary for Agriculture, Cape Town. The apprentice will gain experience in farming in South Africa, and have an opportunity for spying out the land before starting on his own farm.

It will be noted that the Apprentice will neither receive wages, nor pay a fee. He will get free board and lodging in return for his services, and at the same time acquire the experience he is in need of.

Applications for the services of Lady Dairy Experts and Dairy Assistants may also be made to the Under Secretary for Agriculture.

Importation of Trees, Plants, &c

IMPORT REGULATIONS.

The following Regulations are gazetted under Proclamation No. 138, 1901, to take effect from September 1, 1904, all other regulations being cancelled.

1. The introduction into this Colony of trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs, and of fruit of all kinds, grown elsewhere than in South Africa is prohibited, save and except by sea through the Ports of the Colony or by Post.

2. The importation of the following articles is hereby absolutely prohibited:—

(*a*) Grape vines or any portion or fruit of any grape vine, with the exception of vines or portions thereof imported by the Government under such precautionary measures as it may deem necessary.

(*b*) Coffee plants or any portion thereof, with the exception of seed.

(*c*) Eucalypt plants or any portion thereof with the exception of seed.

(*d*) Coniferous plants or any portion thereof, with the exception of seed.

(*e*) Stone-fruit trees or any portion thereof, including seeds, that were grown or produced in any State, Province or Territory of the United States of America or the Dominion of Canada, or in any other country in which either of the diseases known as Peach Yellows or Peach Rosette is found or reported to exist.

(*f*) Peach stocks and peach stones from any country whatsoever.

(*g*) Timber with the bark on except scaffolding poles shipped from the Baltic Sea or from Canada.

3. The importation of any tree or portion thereof, with the exception of fruit, seed, seedling stocks of fruit trees for budding or grafting purposes, and blight proof stock for apples, shall be allowed only by special permission from the Minister for Agriculture. No permit shall be granted for the introduction of more than ten trees or one hundred cuttings of any one variety, nor shall permits be issued for more than an aggregate of one hundred trees or one thousand cuttings to any party during one year. For the purposes of this clause the term "tree" shall include any plant of the nature of a tree excepting garden shrubs. In case of dispute as to whether any plant falls under this restriction, the decision of the Minister shall be final.

4. All trees, plants and portions thereof, such as cuttings, roots, tubers and bulbs and fruit of all kinds and their packages, cases, pots or other coverings, shall, before being delivered to the consignees, undergo an examination by an officer, appointed for that purpose to determine, as far as possible whether or not insects or plant diseases are present; and it shall be the duty of the consignees or his duly appointed agent to open the coverings and to afford every facility to the examining officer during the examination.

5. All trees and woody plants, together with their covering and packing material, shall as a precautionary measure against the introduction of injurious insects be fumigated at the expense of the consignee in the manner prescribed by and to the satisfaction of the examining officer; and if the examining officer deems the treatment expedient, he may extend it to all other plants and all parts thereof.

6. Should any article, in the examination provided for in Clause 4, be actually found to be infested in whole or in part with any insect or plant disease, the introduction of which would be prejudicial to the interests of the Colony, it shall, together with all other articles in the same receptacle, with all covering and packing material, be cleansed or disinfected by the consignee, or at his expense, in the manner prescribed by and to the satisfaction of the examining officer; and if not so cleansed or disinfected, or if any treatment at command shall be deemed by the examining officer, or found by him, to be inefficient for the absolute eradication of the insect or disease, or if the examining officer knows the insect or disease to be of specially dangerous character, the articles shall be destroyed without delay

7. Ordinarily, the inspection, and other treatment of consignments imposed by these Regulations, shall take place on the premises provided for the purpose by the Government at the port of entry; but special arrangements may be made with the Minister for Agriculture for the execution of all the provisions of Clauses 4, 5, and 6 on the premises of the consignee, when approved facilities, inclusive of a proper fumigation chamber are there provided.

8. On the examining officer being satisfied with respect to a consignment that all the Regulations and conditions herein set forth have been fully complied with, he shall issue a certificate to that effect to the consignee; and before the issue of such certificate the consignment shall be under his control for the purposes of these Regulations.

9. Articles subject to examination under these Regulations introduced into this Colony by post shall be intercepted and examined by an officer appointed for the purpose, and if found infected with any noxious insect or plant disease, shall be destroyed or cleansed at the discretion of such examining officer, and if requiring fumigation shall be so treated All expenses of treatment shall be borne by the addressee.

10. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these Regulations, or from any process that may be considered necessary to cleanse or disinfect the articles, or to discover the existence or otherwise of any insect or plant disease.

11. These Regulations shall not apply to any consignment imported in bond for places beyond the borders of the Colony; nor to canned, dried or otherwise preserved articles in which there is no longer any plant life, with the exception of timber with the bark on.

Prohibition of the Importation of Grass Hay from Southern Rhodesia.

By Command of H.E., the Governor, the following Proclamation, No. 166, of September, 10th, 1902, is published in the *Government Gazette* :—

Under and by virtue of the powers and authorities vested in me by Act No. 9 of 1876, intituled "Act to regulate the introduction into this Colony of articles or things which by reason of disease or otherwise might be injurious to the interests thereof," I do hereby proclaim, declare and make known that whereas the infection of Redwate may be conveyed by means of Grass Hay, the importation of Grass Hay from Southern Rhodesia, or from the Bechuanaland Protectorate, shall be and is hereby prohibited; and that all Grass Hay which may enter or be introduced into the Colony in contravention of this Proclamation shall be liable to be destroyed.

And I do hereby declare that this Proclamation shall have effect from and after the date of publication hereof, and shall continue in force until amended or repealed.

And I strictly charge every Resident Magistrate, Field-cornet and Justice of the Peace to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Tobacco Seed.

A small consignment of the undermentioned varieties of Tobacco Seed has just been received from America, and is available for disposal, at the prices quoted :—

White Burley, Yellow Oronoko, Virginia One Sucker, Virginia Pryor, Blue Pryor and Maryland at 6d. per oz.

Connecticut Seed Leaf at 4d. per oz.

Long Leaf Gooch at 7d. per oz.

Havana at 8d. per oz.

Sumatra at 1/7 per oz.

The seed will be distributed in lots not exceeding 3 oz. of each variety, and applications, accompanied by a remittance for the amount due, must be addressed to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received.

Australian Salt Bush Seed.

It is notified for the information of Agriculturists that about 800 lbs. of Sa Bush Seed recently imported by this Department from New South Wales may be obtained in quantities to suit purchasers at 1s. 9d. per lb. (being one-half the cost of importation) upon application to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received, and must be accompanied by a remittance to cover cost (either Bank Draft, Postal Note, P.O. order or Cash.)

Guano.

It is hereby notified for general information that Guano Depots have been established at the following Railway Stations, viz.:—Malmesbury, Moorreesburg, Kalabaskraal, Piquetberg, Caledon, Paarl and Worcester, and that *Ordinary* guano from the Government Islands is obtainable thereat on payment to the local Station Masters of the price, viz.:—£6 10s. per ton of 2,000 lbs. or 13/- per bag of 200 lbs.; in addition to the charge for rail carriage from Cape Town. A bag of 200 lbs. is the smallest quantity supplied.

Applications accompanied by remittance for *Rock* Guano, for use within the limits of the Colony, the price of which is £6 17s. per ton of 2,000 lbs or 13/9 per bag of 200 lbs., delivered at the Cape Town Railway Station, should be made to the Superintendent the Government Guano Islands, Cape Town.

The following is the analysis of the guano:—

	Lime.	Potash.	Nitrogen.	Phosphoric Oxide.		
				Soluble in water.	Soluble in citrate solution.	Total.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Ordinary..	10·65	2·10	13·33	4·02	9·75	9·81
Rock ..	13·01	2·60	13·67	4·95	13·58	13·91

Returning Sheep from Orange River Colony.

The following regulations are issued under Proclamation No. 393, 1904, with regard to the return of sheep to the Colony from the Orange River Colony:—

1 All sheep introduced into this Colony from the Orange River Colony must either pass through one of the authorised Ports of Entry, viz.: Modder River (Division Kimberley), Honeynest Kloof, Witteputs, Belmont and Ramah (Division Herbert), Petrusville (Division Philipstown), Norval's Pont (Division Colesberg) Bethulie and Odendaalstrom (Division Albert) and Aliwal North (Division Aliwal North) or, if intended for immediate conveyance by rail, may be driven direct to the nearest railway station, from any point on the boundary line, between the Modder and Vaal Rivers.

2. All sheep so introduced must be accompanied by a certificate from a Government Inspector of the Orange River Colony that they are either free from Scab or have been dipped under his supervision. In the absence of such certificate, sheep must be dipped at one of the authorised Ports of Entry.

3. All sheep shall be again dipped on reaching their destination.

4. Any person contravening these Regulations shall upon conviction, be liable to fine not exceeding twenty pounds sterling.

Locust Birds.

In view of the ravages caused by Locusts from time to time, the attention of the Public is called to the necessity for protecting and encouraging the birds known as the Great and Small Locust Birds in all parts of the Colony. These birds are of great use to the Agriculturist, seeing that they prey so largely on locusts and other destructive insects which would otherwise leave the land bare of crops and pasturage.

It must be borne in mind that these birds may not be killed as they are specially protected by Law in all parts of the Colony up to and including 5th February, 1906 (Proclamation No. 44 of 1903), and any person wilfully destroying them is liable to fine or imprisonment.

The attention of Field-cornets, Headmen and of farmers generally is drawn to this matter, and it is urgently desired that everyone will do his best to see that the Locust bird is not shot or molested in any way.

Removal of Cattle, Sheep and Goats from Cape Colony to the Orange River Colony.

By proclamation of His Excellency the Lieutenant-Governor of the Orange River Colony, dated February 3, the introduction of horned cattle, sheep or goats from Cape Colony into the Orange River Colony is prohibited except in accordance with the attached schedule. Contravention of the regulations makes the person liable to a fine of £50 or three months with or without hard labour.

SCHEDULE.

(1) The person in charge of horned cattle, sheep and goats introduced under this notice shall obtain and have in his possession a certificate in the form set forth in Annexure "A" hereto, issued and signed by the Resident Magistrate, Veterinary Officer, Justice of the Peace or Inspector of Sheep of the District in the Cape Colony from which the cattle, sheep or goats have come.

(2) The person in charge of such cattle, sheep or goats is liable to be called upon to produce the Certificate aforesaid to the Inspector of Stock at any of the Ports of Entry mentioned in Annexure "B" hereto, or any Justice of the Peace, Police Officer or owner of land over which cattle, sheep or goats may pass or be passing.

ANNEXURE "A."

I do hereby certify that the herein specified (cattle sheep or goats) are free from infectious or contagious disease and have not been in contact with infected animals, and to the best of my knowledge and belief, have not come from or through a locality where any such disease is known to exist, viz:

Number and general description of (cattle, sheep or goats)... ....

Place from which sent........
Owner's name and address..

Name of person in charge...... .. ..
Place in the Orange River Colony, to which cattle, sheep or goats are sent..

Signature of Resident Magistrate, Veterinary Officer, Justice of the Peace, or Inspector of Sheep of the District in the Cape Colony from which (the cattle, sheep or goats) have come.

Place.. ....
Date.......... ....

Ports of Entry.—Frere Bridge, Colesberg Bridge Bethulie Bridge, Norval's Pont Bridge, the farm "Karree Laagte," in the District of Jacobsdal; the farm 'Dalton's Pont, on the farm "Welgedraai," in the District of Fauresmith.

Virus for Redwater or Texas Fever.

Virus for this disease is carefully prepared at the Government Bacteriological nstitute, Grahamstown, and s supplied on demand to farmers at a cost of 1s. 0d. per ose.

Syringes suitable for this operation are supplied at 21/- each, and spare parts for the syringe can be had to replace those which may become broken.

Vaccine for Anthrax or Meltziekte.

Vaccine for this disease, consisting of two vaccines, a first and a second, is supplied from the Government Bacteriological Institute, Grahamstown, in tubes each containing five doses, at a total cost of 2/6 for the first and second vaccine together.

Syringes for the practice of this inoculation can be had on demand, at a cost of 9s. 0d.

Vaccine for Sponziekte or Quarter Evil.

Vaccine for this disease is supplied from the Government Bacteriological Institute, Grahamstown, at a cost of 2s. 6d. for five doses, which includes both the first and second vaccines.

Syringes for use in connection with this vaccine can be had on demand at a cost of 14s. 6d. each.

Regulations for Trout Fishing.

The following Regulations are issued under the "Fish Protection Act, 1899," by Proclamation No. 297, 1904 :—

1. It shall be lawful to fish for trout in the Berg, Breede, Eerste, Hex, and Lourens Rivers, and in any of the Tributaries thereof, and in Princess Vley, in the Cape Division, between the first day of October in any year and the thirty-first day of January in the following year, both days inclusive; and in the Buffalo, Izeli, Keiskama and Kabusie Rivers, and in the Tributaries thereof, between the first day of October in any year and the thirty-first day of March in the following year, both days inclusive : provided the following conditions be observed, namely :—

(a) That no person shall fish for, capture, pursue, or destroy trout of any variety, without first having registered his name with, and obtained a permit from the Resident Magistrate of any of the following districts, viz.:—Cape Town, Paarl, Stellenbosch, Wellington, Worcester, Port Elizabeth, East London, King William's Town, and Grahamstown.

(b) That fishing shall be with rod and line only, and that artificial fly only be used as a lure; no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed ; but this shall not be held to exclude the use of a legitimate landing net or gaff for landing the fish caught.

(c) That if any trout less than twelve inches in length be caught, it be forthwith returned to the water from which it was taken, with as little delay and as little injury as possible.

(*d*) That the consent of the owner or owners on whose ground it is proposed to fish be first obtained.

e) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government official, or by the owner of the property on which the holder of the permit is fishing.

(*f*) That the permit be not transferable.

2. Riparian owners shall not require to obtain a permit to fish for trout in the open waters on their own property during the fishing season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1 of this Schedule.

3. Any person or persons contravening any of the foregoing Regulations, or any of the conditions thereof, shall be liable, on conviction, to a fine not exceeding twenty pounds sterling (£20) for each offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding three months.

Government Labour Bureau, Riebeek Square, Cape Town.

Men in search of employment, resident in Cape Town or Suburbs, should apply personally at the above Office between the hours of 10 and 12 in the forenoon and 2 and 3 in the afternoon. A list of vacant situations is posted in the window. In country districts applications should be made on the prescribed form which can be obtained at the Resident Magistrate's Office.

Notice to Employers.

The Government Labour Bureau undertake, free of charge, the preliminary selection of Candidates for vacant situations, whether in towns or on farms, in all parts of South Africa, the most minute attention being paid to antecedents and testimonials.

Employers should furnish full particnlars of their requirements on the prescribed orm whenever a personal visit to the Bureau is impossible.

Forms can, in the Country districts, be obtained at the Resident Magistrate's Office.

All letters and applications for employment or for the services of artisans, labourers etc., should be addressed to THE DIRECTOR, GOVERNMENT LABOUR BUREAU, RIEBEEK SQUARE, CAPE TOWN.

NOEL JANISCH.
Under Colonial Secretary.

Netting for Fruit Trees.

The Board of Horticulture having decided to continue the importation of fruit tree netting, applications for such netting for the season 1905-1906 will be received by the undersigned not later than the 1st of April.

The Netting is sold per piece. Fly netting about 40 yards long by 70 inches wide, 8s. 6d. Bird Netting about 45 yards long by 13 feet wide, 15s.

C. MAYER,
Secretary, Western Province Board of Horticulture.

Stellenbosch, 3rd Dec. 1904.

Distribution of American Vine Cuttings.

The following are the arrangements made for the distribution of American Vine Cuttings, during the Season 1905: –

1. All applications must be in writing upon printed forms obtainable from the Civil Commissioner and Field-Cornets of the Division, and must be addressed to the Local Board of Distribution for the District concerned.

2. All applications must be sent in to the local Boards (addressed to the care of the Civil Commissioner) not later than 31st March (inst.), after which date no applications can be received.

3. The local Boards will, not later than the 15th April, advise the Government Viticultural Expert, Groot Constantia, of the number of cuttings of each variety applied for, and they will then be informed what quantity is available and at the disposal of their district.

4. Upon receipt of this information, the local Boards will allot the cuttings according to the number available, notifying the applicants in due course. Allottees must pay for the cuttings allotted to them not later than the 19th May, after which date all cuttings not paid for shall be considered as not wanted, and shall be forfeited and held to be available for allotment to some other person.

5. The complete lists showing to whom the Boards have allotted cuttings and the usual particulars as to postal and railway addresses shall be forwarded direct to the Government Viticultural Expert not later than 25th May.

6. The distribution of cuttings will commence as soon as possible after the 1st June. Allottees will receive their cuttings direct from the nurseries, and will be advised by post of the despatch of same.

7. Cuttings not than less three-sixteenths of an inch in thickness and 12 inches long will be delivered, and will be charged for at the rate of 10s. per 1,000. All cuttings will, where practicable, be delivered in 3 feet lengths.

8. No complaints in respect of quality or shortness of cuttings will be entertained unless lodged within ten days after despatch of the cuttings.

GAME SEASONS, 1905.

In view of the near approach of the Shooting Season, the following schedules showing the General and Special Close Seasons for Game in the respective districts of the Colony at the present date are published for the information and guidance of all concerned

Agricultural Department, Cape Town, February, 1905.

GENERAL CLOSE OR FENCE SEASON

Close or Fence Season	Division			
I FROM 1st JULY to LAST DAY OF FEBRUARY	Bredasdorp Caledon Cape Clanwilliam Ladismith	Malmesbury Mossel Bay Namaqualand Oudtshoorn Paarl	Piquetberg Riversdale Robertson Stellenbosch Swellendam	Tulbagh Van Rhynsdorp Worcester
II FROM 1st AUGUST to LAST DAY OF FEBRUARY	Aberdeen Albert Aliwal North Barkly East Beaufort West Britstown Calvinia Carnarvon Cathcart Ceres Colesberg	Cradock East London Fraserburg George Glen Grey Graaff-Reinet Hanover Herschel Hope Town *Humansdorp (Birds) Jansenville	Kenhardt King William's Town Knysna *Komgha (Birds) Middelburg Molteno Murraysburg Peddie Philipstown Prieska Prince Albert	Queenstown Richmond Steynsburg Stutterheim Sutherland Tarka Uniondale Victoria West Willowmore Wodehouse
III FROM 1st SEPTEMBER TO LAST DAY OF FEBRUARY	Albany Alexandria Bathurst	Bedford Fort Beaufort Humansdorp (Antelopes)	Komgha (Antelopes) Port Elizabeth Somerset East	Stockenstrom Uitenhage Victoria West
IV FROM 16th AUGUST TO 31st MARCH	Barkly West Hay	Herbert Kimberley	Gordonia Mafeking	Vryburg
V. FROM 1st SEPTEMBER to 15th APRIL	Griqualand East, Territory of	Transkei, including Gcalekaland	Tembuland including Emigrant Tembuland and Bomvanaland	Port St John's

* In Humansdorp and Komgha Divisions Antelopes have a Special Season from 1st September to end of February.

Summary of General and Special Close Seasons, Special Protections, and Exemptions, February 21, 1905.

(Divisions alphabetically arranged according to Groups).

Division.	General Close Season	Special Close Season	Animals Specially Protected	Animals exempted from protection
GROUP I				
Bredasdorp	July 1 to end February	..		
Caledon ..	do	Wild Duck, Dec 1 to Jan 31 Wild Geese do Snipe do	All Game on Town Commonage up to July 6, 1905 All kinds of Antelopes to end February, 1907	
Cape ..	do	Cape Turtle Dove, June 1 to Dec 31 Large Yellow Seedeater, June 1 to Nov 30 Longtailed Sugarbird, June 1 to Nov 30 . .. Malachite Sunbird, June 1 to Nov 30 Double collared Sunbird, June 1 to Nov 30 Orange Breasted Sunbird, June 1 to Nov 30 .. .. Grysbuck in Constantia, Dec 1 to June 30 Quail on Robben Island, July 1 to end February .	Certain small birds, up to December 11, 1907 Fiscal Shrike, Constantia up to December 11, 1907 Game on Durbanville Commonage, up to August 21, 1907	
Clanwilliam .	do	Pauw, December 1 to June 30		Hares up to November, 5, 1906
Ladismith .	do	..	Koodoo, to end of February, 1908	Hares, up to November, 17 1907
Malmesbury ..	do	Paauw, Decem 1 to June 30		
Mossel Bay .	do		Game on Mossel Bay Commonage to January 31 19 5	

Division.	General Close Season	Special Close Season	Animals Specially Protected	Animals Exempted from Protection
GROUP 1 —*con*				
Namaqualand ..	July 1 to end February	Paauw, December 1 to May 31 Namaqua Partridge, May 1 to Oct 31 Wild Ostriches, June 1 to Jan 31 .. Gemsbok, December 1 to May 31	Paauw, to March 21, 1907 Namaqua Partridge, to March 21, 1907	
Oudtshoorn .	do		Wild Duck, Secretary Bird, and certain small birds to February 5, 1908 All Game, up to August 1, 1207	Hares, up to October 27th, 1905
Paarl .	do		do on Paarl Mt Commonage, to August 20, 1906	
Piquetberg .	do	Paauw, December 1 to June 30		
Riversdale ..	do	..	Game on Riversdale Commonage, to May 16, 1905 Koodoo, up to end February, 1908	
Robertson	do			Hares, up to November, 17, 1905.
Stellenbosch	do			
Swellendam	do	Grysbok, January 1 to June 30	Game on Swellendam Commonage to November 5, 1905 Game on Heidelberg Commonage to June 30, 1907	
Tulbagh .	do	..	All Game to June 30, 1907	
Van Rhynsdorp	do	Paauw, December 1 to June 30	Secretary Bird to June 2, 1907 Blaauw Valk do do	
Worcester ..	do	Paauw, December 1 to June 30 .	..	
GROUP 2.				
Aberdeen ..	August 1 to end February	Guinea Fowl, October 1 to March 31	Game on Aberdeen Commonage to September 20, 1906	
Albert ..	do	..	.	

Division.	General Close Season.	Special Close Season.	Animals Specially Protected.	Animals Exempted from Protection.
Group 2.—*con.*				
Aliwal North ..	August 1 to end February	..	Rhebok, to July 2, 1906	
Barkly East ..	do	..	Antelopes to January 28, 1907	
Beaufort West	do	Wild Ostriches, June 1 to 360th day after	Game and Birds of all kinds in Beaufort West Municipality to Aug. 22, 1905 Wild Ostriches to November 5, 1906	
Britstown ..	do	..		
Calvinia ..	do	Paauw, December 1 to June 30 .. Namaqua Partridges, August 1 to end February .. .. .. Wild Ostriches, June 1 to 360th day after	..	
Carnarvon ..	do	Paauw, December 1 to May 31 .. Namaqua Partridge, Dec 1 to May 31	..	
Cathcart ..	do	Partridges, August 1 to March 31 ..	Antelopes (except Springbuck) to December 23, 1906	
Ceres ..	do	Paauw, December 1 to June 30	Doves in Ceres Municipality to December 11, 1907 Game, including Rock Rabbits in Ceres Municipality to December 8, 1907	
Colesberg ..	do	..	Game on Colesberg Commonage to January 15, 1905	
Cradock ..	do	..	Small birds in Cradock Municipality to August 7, 1907	
East London ..	do	..	Bushbuck Ewes to Nov. 12, 1905	
Fraserburg ..	do	Paauw February 1 to July 31 .. Namaqua Partridge, Feb 1 to July 31	Duiker to August 4, 1907 Steenbok do Hares do	
George ..	do	Paauw, August 1 to January 31 .. Wild Duck, Wild Goose, Coot: Aug. 1 to end Feb.	..	

Division.	General Close Season.	Special Close Season.	Animals Specially Protected.	Animals Exempted from Protection.
GROUP 2.—*con.*				
Glen Grey ..	August 1 to end February	..	..	
Graaff-Reinet	do	Guinea Fowl, October to January 31	..	
Hanover ..	do	Springbuck, June 1 to November 30	..	
Herschel ..	do	..	..	
Hope Town ..	do	Wild Ostriches, 1st June to May 30.. Namaqua Partridges, August 1 to end February	.. ..	
Jansenville ..	do	..		
Kenhardt ..	do	Wild Ostriches, April 1 to October 31	..	
King William's Town ..	do	..	Bushbuck Ewes, to August 20, 1906	
Knysna ..	do	..	Secretary Bird, to February 2, 1905 Stanley or Blue Crane do Certain small birds do	
Komgha ..	(Birds) do	Antelopes, Sept 1 to end Februrry .	Bushbuck Ewes, to end Feb , 1907	Hares Guinea Fowl Pheasants } to Jan 15. 1906
Middleburg ..	do	..	..	
Molteno ..	do	..	..	
Murraysburg ..	do	..	Game on Murraysburg Commonage, March 2, 1907	
Peddie ..	do	..	Bushbuck Ewes, to June 11, 1906 Certain small birds, to Aug 11, 1906	
Philipstown ..	do	Springbuck, December 1 to Jan 31 ..	..	
Prieska ..	do	Rhebok, 1st August to January 31 .. Steenbok, do .. Duiker do .. Hares do .. Namaqua Partridges, Aug 1 to end Feb	Wild Ostriches, to April 2, 1906	
Prince Albert ..	do	..	Springbuck, Rhebuck, Steenbok, Grijsbok, Duiker, Wild Ostriches, to January 19, 1908	

Division.	General Close Season.	Special Close Season	Animals Specially Protected	Animals Exempted from Protection
GROUP 2.—*con*				
Queenstown ..	August 1, to end February	Paauw, December 1 to June 30	Antelopes Guinea Fowl Partridges Dikkop Hares } On Queenstown Commonage, to May 31, 1907	
Richmond ..	do	..	..	
Steynsburg ..	do	..	..	
Stutterheim ..	do	.	Bushbuck Ewes, to November 16, 1905	
Sutherland ..	do	..	..	Paauw to Nov 17, 1907
Tarka ..	do	..	Game on Tarkastad Commonage, to June 11, 1906	Hares to Nov 7, 1907 Paauw to Jan 19, 1908
Uniondale .	do	.	Antelopes, to December 31, 1905 ..	Hares to Feb 4, 1907
Victoria West	do	Namaqua Partridges, August 1 to end February	..	
Willowmore ..	do	.	..	
Wodehouse	do	..	..	
GROUP 3.				
Albany ..	September 1, to end Feb	Partridges Pheasants } August 1 to end February	Plovers, Grebes, Owls and small birds in Grahamstown Municipality, to February 7, 1607 .. Secretary Birds, Herons, Hawks, Kites, Owls and other birds, to November 16, 1907 Paauw Oribe Rhebok Bushbuck Ewes } to Oct 23, 1907	Hares to April 4, 1905

Division.	General Close Season.	Special Close Season.	Animals Specially Protected.	Animals Exempted from Protection.
GROUP 3—*con.*				
Alexandria ..	September 1 to end Feb.	..	Bushbuck Ewes, to August 22, 1905 Rhebok, Oribe, Bleek Steenbok, Paauw, Knorhaan, to January 15, 1906	Hares to March 23, 1905.
Bathurst ..	do	..	Bushbuck Ewes, to May 16, 1905 .. Birds on Kowie River Banks, to July 20, 1906 Game in Port Alfred Municipality, to May 4, 1906 .. .. Game on unoccupied Crownlands to August 25, 1906	Hares to April 16, 1906.
Bedford ..	do	..	Wild Ostriches, to December 31, 1905 Bushbuck Ewes, August 20, 1906 ..	Hares, Guinea Fowl, Pheasants, to Jan 16, 1908.
Fort Beaufort	do	..	Bushbuck Ewes, to October 26, 1906	
Humansdorp .. (*Antelopes*).	do	Paauw, August 1 to January 31 .. Dikkop do .. Partridges, July 1 to January 31 ..	..	Paauw, Dikkop, Hares, to Feb 25, 1907.
Komgha .. (*Antelopes.*)	do	..	Bushbuck Ewes, to end February, 1907	
Port Elizabeth	do	Paauw, September 1 to end February Dikkop do Partridges, July 1 to end February Wild Duck, Sept 1 to December 31 Cape Turtle Dove, June 1 to Dec 31	Certain small birds in Port Elizabeth Municipality, to December 30, 1906	
Somerset East	do	Bushbuck, Steenbok, Duiker, Klipspringer, August 1 to end February ..	Bushbuck Ewes, to April 11, 1907 ..	Guinea Fowl, Hares, to Nov 12, 1906.

Division.	General Close Season.	Special Close Season.	Animals Specially Protected.	Animals Exempted from Protection.
GROUP 3.—*con.*				
Stockenstrom ..	September 1 to end Feb.	..	Bushbuck Rhebok Duiker Grijsbok } to November 5, 1906	Hares to Nov. 2, 1906 Guinea Fowl to November 5, 1905
Uitenhage ..	do	Partridges July 1 to April 30 . Paauw Dikkop Knorhaan } September 1 to end February .. .. Wild Duck, September 1 to Dec 31..	Small birds in Uitenhage Municipality, to June 14, 1907	
Victoria East ..	do	..	..	
GROUP 4.				
Barkly West ..	Aug. 16 to March 3	Namaqua Partridge, August 16 to March 31 . .. Wild Ostriches, June 1 to May 30 ..	..	
Hay ..	do	Namaqua Partridges, August 16 to March 31 .. .. .. Wild Ostriches, June 1 to May 30 ..	..	
Herbert ..	do	Namaqua Partridges, August 16 to March 31 .. .. .. Wild Ostriches June 1 to May 30 .. Springbuck, September 1 to Jan 31..	Wild Ostriches Koodoo Hartebeest } up to Nov 7, 1905	
Kimberley ..	do	Namaqua Partridges, August 16 to March 31 .. .. .. Wild Ostriches, June 1 to May 30 ..	..	
Gordonia ..	do	..	..	
Mafeking ..	do	...	Game on Mafeking Commonage, to April 21, 1906	
Vryburg ..	do	Wild Ostriches Sept 1 to end Feb Namaqua Partridges, Aug 16 to Mar 31	Springbuck to February 25, 1907 Wild Ostriches, to January 19, 1908	

Division.	General Close Season.	Special Close Season.	Animals Specially Protected.	Animals Exempted from Protection.
GROUP 5.				
Griqualand East, Territory of ..	September 1 to April 15.	..	Bushbuck Ewes Klipspringers Rooi Rhebok Oribe Rietbok } to June 13, 1905 Great and Small Locust birds to February 5, 1906 Game on the Commonages of Kokstad, Mount Ayliff, Mount Frere, Qumbu, Tsolo, Maclear, Mount Fletcher, Matatiele, Umzimkulu, to February 5, 1906	
Tembuland, including Emigrant Tembuland and Bomvanaland	do	In Elliot District for Partridges, September 1 to end February .. .. Wild Duck Wild Goose Snipe } Sept 1 to April 15	Great and Small Locust birds to February 5, 1906 Antelopes in Elliot District, to March 19, 1906 Game in Engcobo District, to February 25, 1907 Game on Cala Commonage, to April 21, 1907	
Transkei, including G'calekaland	do	..	Great and Small Locust birds to February 5, 1906 Game in Kentani District to December 1, 1907	
Port St Johns..	do	..	Game to March 19, 1906	

NOTE.—The GREAT AND SMALL LOCUST BIRDS are also protected throughout the Colony up to February 5, 1906.

"Royal" or Big Game.

A Special Permit to shoot any of the varieties of Big Game mentioned hereunder must be obtained from the Government in addition to the Ordinary Game Licence. Application should be made to the Under Secretary for Agriculture through the Resident Magistrate of the Division in which the Game is to be hunted.

Description of Game.	Where found; and General or Special Close Season.	
Elephant	Alexandria, Uitenhage, 1st September to end of February George, Knysna, 1st August to end of February NOTE.—As Elephants only exist in limited numbers in these Divisions, special permits are only granted in very exceptional cases. Landed proprietors, or persons authorized by them, are, however, entitled to kill Elephants on their own property.	
Eland	Only a few domesticated Elands are to be found in the Colony—at Groot Schuur, Rondebosch; and in Graaff-Reinet Division. No permits are granted to shoot these animals.	
Hippopotamus	Not to be found in the Colony	
Zebra	Cradock	1st August to end of February
	George	
	Prince Albert	
	Uniondale	
	Oudtshoorn	1st July to end of February
	Somerset East	1st September to end of February

NOTE.—Only a few Troops of Zebras exist in the above Districts, and the destruction of these animals is consequently prohibited; no permits are now isssued.

Buffalo	Albany	1st September to end of February
	Alexandria	do do
	Bathurst	do do
	Uitenhage	do do
Bontebok	Bredasdorp	1st July to end of February
	Swellendam	do do
Blesbok	Swellendam	1st July to end of February
	Prieska	1st August do
	Steynsburg	do do
Gemsbok	Barkly West	16th August to 31st March
	Gordonia	do do
	Hay	do do
	Mafeking	do do
	Kenhardt	1st August to end of February
	Namaqualand	1st December to 31st May
	Preiska	1st August to end of February
Hartebeest	Barkly West	16th August to 31st March
	Gordonia	do do
	Hay	do do
	Kimberley	do do
	Mafeking	do do
	Vryburg	do do
	Herbert	Specially protected up to 7th November, 1905
Koodoo	Albany	1st September to end of February
	Fort Beaufort	do do
	Uitenhage	do do
	Victoria East	do do
	Jansenville	1st August do
	Kenhardt	do do
	Prieska	do do
	Prince Albert	do do
	Steytlerville	do do
	Willowmore	do do
	Barkly West	16th August to 31st March
	Gordonia	do do

Description of Game.	Where found; and General or Special Close Season.			
Koodoo	Hay	16th August to	31st March	
	Kimberley	do	do	
	Mafeking	do	do	
	Vryburg	do	do	
	Herbert	Specially protected	up to	7th November, 1905
	Ladismith	do	do	end of February, 1908
	Oudtshoorn	do	do	4th of August, 1907
	Riversdale	do	do	end of February, 1908
Rietbok	Kimberley	16th August to	31st March	
	Komgha	1st September to	end of February	
	Griqualand East	Specially protected	to 13th June, 1905	
Wildebeest	Gordonia	16th August to	31st March	
	Hay	do	do	
	Mafeking	do	do	
	Vryburg	do	do	

Game Specially Protected for certain Periods.

Description of Game.	Division in which it is protected and for what period.		
All kinds of Game	Aberdeen (Town Commonage)	up to and including	10 September, 1906.
	Bathurst (Port Alfred Municipality)	do	4 May, 1906
	do (Unoccupied Crown Lands)	do	25 August, 1906
	Beaufort West Municipality	do	22 August, 1905
	Caledon Town Commonage	do	6 July, 1905
	Cape, Durbanville Commonage	do	21 August, 1907
	Ceres Division	do	8 December, 1907
	Colesberg, Colesberg Commonage	do	15 January, 1908
	East Griqualand — Commonages of Kokstad, Mount Ayliff, Mount Frere, Qumbu, Tsolo, Maclear, Mount Fletcher, Matatiele, Umzimkulu		13 June, 1905
	Mafeking Commonage	do	21 April, 1906
	Murraysburg do	do	2 March, 1907
	Oudtshoorn Division	do	4 August, 1907
	Paarl, Mountain Commonage	do	20 August, 1906
	Port St. John's District	do	19 March, 1906
	Riversdale Commonage	do	16 May, 1905
	Swellendam do	do	5 November, 1905
	Do Heidelberg Commonage	do	30 June, 1907
	Tarkastad Commonage	do	11 June, 1906
	Tulbagh Division	do	30 June 1907
	Tembuland — Engcobo Commonage	do	25 February, 1907
	Tembuland — Cala do	do	21 April, 1907
	Transkei, Kentani District	do	1 December, 19 .7
Antelopes, all kinds of	Barkly East Division	do	28 January, 1907
	Caledon	do	end February, 1907
	Cathcart	do	23 December, 1906
	Queenstown Commonage	do	31 May, 1907
	Tembuland—Eliot District	do	19 March, 1906
	Uniondale Division	do	31 December, 1905
Bushbuck Ewes	Albany Division	do	23 October, 1907
	Alexandria do	do	22 August, 1905
	Bathurst do	do	16 May, 1905
	Bedford do	do	20 August, 1906
	East London Division	do	12 November, 1905

Description of Game.	Division in which it is protected, and for what period.		
Bushbuck Ewes	Fort Beaufort Division	up to and including	26 October, 1905
	Griqualand East, Territory of	do	13 June, 1905
	King William's Town Division	do	20 August, 1906
	Komgha do	do	end February, 1907
	Peddie do	do	11 June, 1906
	Somerset East Commonage	do	11 April, 1907
	Stockenstrom Division	do	5 November, 1906
	Stutterheim do	do	16 November, 1905
Duiker Antelope	Fraserburg Division	do	4 August, 1907
	Prince Albert do	do	19 January, 1908
	Stockenstrom do	do	5 November, 1906
Grysbok	Prince Albert Division	do	19 January, 1908
	Stockenstrom do	do	5 November, 1906
Hartebeest	Herbert Division	do	7 November, 1905
Koodoo	Herbert Division	do	7 November, 1905
	Ladismith do	do	end February, 1908
	Riversdale Commonage	do	end February, 1908
Klipspringer	Griqualand East, Territory of	do	13 June, 1905
Oribe	Albany Division	do	23 October, 1907
	Alexandria do	do	15 January, 1906
	Griqualand East, Territory of	do	13 June, 1905
Rhebok	Albany Division,	up to and including	23 October, 1907
	Alexandria Division	do	15 January, 1906
	Aliwal North „	do	2 July, 1906
	Griqualand East, Territory of	do	13 June, 1905
	Prince Albert Division	do	19 January, 1908
	Stockenstroom do	do	5 November, 1906
Rietbok	Griqualand East, Territory of	do	13 June, 1905
Springbok	Prince Albert Division	do	19 January, 1908
Steenbok	Alexandria Division	do	15 January, 1906
	Fraserburg do	do	14 August, 1907
	Prince Albert Division	do	19 Jan., 1908
Hares	Fraserburg do	do	4 August, 1907
	Queenstown Commonoge	do	31 May, 1907
Rock-rabbits	Ceres Division	do	8 December, 1907

Birds—Game and other.

Description of Game.	Where found; and General Special or Close Season.		
Dikkop	Queenstown Commonage,	up to and including	31 May, 1907
Guinea fowl	do	do	31 May, 1907
Knorhaan	Alexandria Division	do	15 Jan., 1906
Namaqua Partridges	Namaqualand Division	do	21 March, 1907
Partridges	Queenstown Commonage	do	31 May, 1907
Pauw	Albany Division	do	23 Oct., 1907
	Alexandria Division	do	15 Jan., 1906
	Namaqualand Division	do	21 March, 1907
Wild Duck	Bathurst, Kowie River banks	do	23 July, 1906
	Oudtshoorn Division	do	5 Feb., 1908
Wild Ostriches	Bedford Division	do	31 Dec., 1905
	Britstown do	do	5 Nov., 1906
	Herbert do	do	7 Nov., 1905
	Prince Albert Division	do	19 Jan., 1908
	Prieska Division	do	2 April, 1906
	Vryburg do	do	19 June, 1908

Description of Game.	Where found ; and General, Special or Close Season.		
Secretary Bird	Albany Division,	up to and including	16 Nov., 1907
	Oudtshoorn Division	do	5 Feb., 1908
	Uitenhage Municipality	do	14 June, 1907
	Van Rhynsdorp Division	do	2 June, 1907
Plovers	Albany Division	do	16 Nov., 1907
	Bathurst, Kowie River banks	do	20 July, 1906
	Oudtshoorn Division	do	5 Feb., 1908
Grebes	Albany Division	do	16 Nov., 1907
	Bathurst, Kowie River banks	do	20 July, 1906
	Cradock Municipality	do	7 Aug., 1907
Owls	Albany Division	do	16 Nov., 1907
	Cradock Municipality	do	7 Aug., 1907
	Oudtshoorn Division	do	5 Feb., 1908
	Uitenhage Municipality	do	14 June, 1907
Hawks and Vultures	Albany Division	do	16 Nov., 1907
	Uitenhage Municipality	do	14 June, 1907
Blue Hawk	Oudtshoorn Division	do	5 Feb., 1908
	Van Rhynsdorp Division	do	2 June, 1907
Fiscal Shrikes ..	Cape, Constantia area	do	11 Dec., 1907
Doves	Albany Division	do	16 Nov., 1907
	Bathurst, Kowie River banks	do	20 July, 1906
	Cape Division	do	11 Dec., 1907
	Ceres Municipality	do	11 Dec., 1907
	Cradock Municipality	do	7 Aug., 1907
	Oudtshoorn Division	do	5 Feb., 1908
	Peddie Division	do	14 Aug., 1905
	Port Elizabeth Municipality	do	30 Dec., 1906
Thrushes, Spreeuws, Sunbirds, Canaries, Wagtails, Swallows and certain other small birds.	Albany Division	do	16 Nov., 1907
	Bathurst, Kowie River banks	do	20 July, 1906
	Cape Division	do	11 Dec., 1907
	Cradock Municipality	do	7 Aug., 1907
	Oudtshoorn Municipality	do	5 Feb., 1908
	Port Elizabeth Municipality	do	30 Dec., 1906
	Uitenhage Municipality	do	14 June, 1907
Birds of all kinds.	Beaufort West Municipality	do	22 Aug., 1905
	Peddie Division	do	14 Aug., 1905
Great and Small Locust Birds	Over the whole Colony, including the native territories, but excluding Pondoland		5th Feb., 1906

Special Close Seasons.

NOTE.—In certain divisions it has been found desirable to have a Special Close Season for various animals and birds, and to include certain birds under the provisions of the Game Acts.

Description of Game.	Division.	Close Season.
All kinds of Antelopes	Humansdorp	1st September to end of February
	Komgha	
Bushbuck	Somerset East	1st August to end of February
Duiker	Prieska	1st August to 31st of January
	Somerset East	1st August to end of February
Gemsbok	Namaqualand	1st December to 31st May
Grysbok	Cape, Constantia area	1st December to 30th June
	Swellendam	1st January to 30th June
Klipspringers	Somerset East	1st August to end of February
Rhebok	Prieska	1st August to 31st January
Springbuck	Hanover	1st June to 30th November
	Herbert	1st September to 31st January
	Hopetown	1st August to end of January
	Philipstown	1st December to 31st January
Steenbok	Prieska	1st August to 31st January
	Somerset East	1st August to end of February
Hares	Prieska	1st August to 31st January
Rock-rabbits	Ceres (Municipality)	Up to 8th December, 1907
Dikkop	Humansdorp	1st August to 31st January
	Port Elizabeth and Uitenhage	1st September to end of February
Guinea Fowl	Aberdeen	1st October to 31st March
	Graaff-Reinet	1st October to 31st January
Knorhaan	Uitenhage	1st September to end of February
Namaqua Partridge or Sand Grouse	Barkly West	16th August to 31st March
	Calvinia	1st August to end of February
	Carnarvon	1st December to 31st May
	Fraserburg	1st February to 31st July
	Hay	16th August to 31st March
	Herbert	16th August to 31st March
	Hopetown	1st August to end of February
	Kimberley	16th August to 31st March
	Namaqualand	1st May to 31st October
	Prieska	1st August to end of February
	Victoria West	do do
	Vryburg	16th August to 31st March
Partridge	Albany	1st August to end of February
	Cathcart	1st August to 31st March
	Elliot (Tembuland)	1st September to end of February
	Humansdorp	1st July to 31st January
	Port Elizabeth	1st July to end of February
	Uitenhage	1st July to 30th April
Paauw	Calvinia, Ceres, Clanwilliam, Malmesbury, Piquetberg, Queenstown, Van Rhynsdorp, Worcester	1st December to 30th June
	Carnarvon, Namaqualand	1st December to 31st May
	Fraserburg	1st February to 31st July
	George, Humansdorp	1st August to 31st January
	Port Elizabeth, Uitenhage	1st September to end of February
Pheasant	Albany	1st August to end of February
Quail	Cape	1st July to end of February
Wild Duck	Caledon	1st December to 31st January
	George	1st August to end of February
	Port Elizabeth and Uitenhage	1st September to 31st December
	Elliot (Tembuland)	1st September to 15th April

Description of Game.	Division.	Close Season.
Wild Goose	Caledon	1st December to 31st January
	George	1st August to end of February
	Elliot (Tembuland)	1st September to 15th April
Coot *Snipe*	Caledon	1st December to 31st January
	George	1st August to end of February
	Elliot (Tembuland)	1st September to 15th April
Cape Turtle Dove	Cape	1st June to 31st December
	Port Elizabeth	
Large Yellow Seed-eater or Geel Saysie *Long tailed Sugar Bird or Zuiker Vogel* *Malachite Sunbird* *Double-collared Sunbird* *Orange-breasted Sunbird*	Cape	1st June to 30th November
Wild Ostriches	Beaufort West, Calvinia	1st June to the 360th day after
	Barkly West, Hay, Hope Town, Kimberley	1st June to 30th May
	Herbert	1st June to 30th May, but Ostriches are now specially protected in this Division up to and including 7th November, 1905.
	Kenhardt	1st April to 31st October
	Namaqualand	1st June to 31st January
	Vryburg	1st September to end of February

NOTE.—To kill Wild Ostriches on unoccupied Crown Lands, a Licence fee of £20 for the season must be taken through the Resident Magistrate of the Division in which the birds are to be hunted. Further, an export duty of a £100 is levied on each Ostrich (wild or tame) exported to other countries, and £5 on every Egg; except to any State or Country that imposes a duty of not less than these respective amounts.

Birds specially included as Game.

Description.	Division.
Quail	Cape—on Robben Island
Namaqua Partridge	Barkly West Calvinia Carnarvon Fraserburg Hay Herbert Hope Town Kimberley Namaqualand Prieska Victoria West Vryburg
Wild Duck	George Port Elizabeth Uitenhage

Description.	Division.
Wild Goose	George Elliot District (Tembuland)
Snipe	Elliot District (Tembuland)
Coot	George

Birds and other Animals exempted from the Operation of the Game Acts.

Description of Game.	Division in which exempt and up to what date.		
Hares	Albany,	up to and including	4 April, 1905
	Alexandria	do	23 March, 1905
	Bathurst	do	16 April, 1906
	Bedford	do	19 January, 1908
	Clanwilliam	do	5 November, 1906
	Humansdorp	do	25 February, 1907
	Komgha	do	15 January, 1906
	Ladismith	do	17 November, 1907
	Oudtshoorn	do	27 October, 1907
	Robertson	do	7 November, 1905
	Somerset East	do	12 November, 1906
	Stockenstrom	do	2 November, 1906
	Tarka	do	7 November, 1905
	Uniondale	do	4 February, 1907
Dikkop ..	Humansdorp	do	25 February, 1907
Guineafowl	Bedford	do	19 January, 1908
	Komgha	do	15 January, 1906
	Somerset East	do	12 November, 1906
	Stockenstrom	do	5 November, 1906
Pheasants ..	Komgha	do	15 January, 1906
Paauw	Bedford	do	19 January, 1908
	Humansdorp	do	25 February, 1907
	Sutherland	do	17 November, 1907
	Tarka	do	19 January, 1908

Game Reserve Declared under Act No. 33 of 1899.

Division.		Proclamation.	
		No.	Date.
Namaqualand ..	From the south-eastern Beacon of the Farm "Koeries and Taukheis," called "N. E. Sector Berg," as shown on plan No. 5 O.P., filed in the Surveyor-General's Office, thence along the boundaries of the following farms, so as to exclude them from this area:— "Koeries and Taukheis," "Taaibosch Mond," "Koams and Zout Vlei," "ǂNaghas," "Oograbies," "Zuurwater," "Aggeneys," "Hartebeest Vlei" and "Banken," to its south-western Beacon; thence in a straight line to the Beacon first named (about 120,226 morgen).	241	14th Aug., 1903.

Forest Reserves.

Permits are issued to a limited extent for shooting in the Crown Forests: information as to conditions of Permit and Scale of Charges may be obtained on application to the Conservators at Cape Town, King William's Town and Knysna.

In the Forest Reserves of the Transkei, Tembuland, and East Griqualand no person is allowed to hunt, catch, pursue or shoot at game, or trespass with dog or gun, without a written permit from the Conservator of Forests or other duly qualified Forest Officer.

Trout.

In pursuance of the efforts made by the Government for some time past for the acclimatization of these fish in South Africa, Trout have from time to time been placed in several Rivers and Vleys in the Western Districts and in the Eastern Province.

The undermentioned waters have, so far, been declared open for Fly-fishing:—

The Eerste, Lourens, Berg, Breede, and Hex Rivers and their tributaries, and Princess Vlei in the Cape Division, from 1st October to 31st January.

The Keiskama, Izeli, Buffalo, and Kubusi Rivers, and their tributaries, from 1st October to 31st March.

The dates mentioned above are, however, liable to alterations, and Sportsmen would do well to satisfy themselves as to the correct dates when taking out their Permits.

The following conditions are at present in force:—

1. (*a*) That no person shall fish for, capture, pursue or destroy Trout of any variety, without first having registered his name with, and obtained a permit from the Resident Magistrate of any of the following Districts, viz.:—Cape Town, Paarl, Stellenbosch, Wellington, Worcester, Port Elizabeth, East London, King William's Town, and Grahamstown.
   (*b*) That fishing shall be with Rod and Line only, and that Artificial Fly be used as a lure: no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed, but this shall not be held to exclude the use of a legitimate Landing Net or Gaff for landing the fish caught.
   (*c*) That if any Trout less than Twelve Inches in length be caught, it be forthwith returned to the water from which it was taken, with as little delay and as little injury as possible.
   (*d*) That the consent of the owner or owners on whose ground it is proposed to fish be first obtained.
   (*e*) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government Official, or by the owner of the property on which the holder of the permit is fishing.
   (*f*) That the permit be not transferable.

2. Riparian Owners shall not require to obtain a permit to fish the open waters on their own property during the Fishing Season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1, preceding.

3. Any person or persons contravening any of the foregoing Regulations shall be liable, on conviction, to a Fine not exceeding Twenty Pounds Sterling (20) for each Offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding Three Months.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V. of *Agricultural Journal.*

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); †Dairy and its Products by D. Hutcheon (2d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); †Hessian Fly (1d.); Insect Pests, their Origin and Means of Suppression (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d); Pear Slug, Paris Green (1d.); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Legislation to exclude Plant Pests (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d.): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); Fumigation for Scale Insects (1d); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); *Gas Treatment for Scale Insects (3d.); Another Introduced Scale Pest (1d); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Natural Enemies of the Fruit Fly (3d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); Cyanide Gas Fumigation (1d.); The Fruit Moth (1d.)

Note.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (3d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d); Netting for Fruit Trees (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and their treatment (1s.); Horse Sickness (2d.); *Heartwater (1d.); *Liver Disease among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.); †Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); Wool v. Mohair (1d.); †International Conference of Sheep Breeders (1d.); The Eye and its Diseases,(1d.): Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d.); Persian Sheep and Heartwater (1d); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d); African Coast Fever with Description of Dipping Tank (3d.); Notes on the so-called Paralysis Tick (1d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.)

Viticulture.

*Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.)

Miscellaneous.

Game Seasons (1d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.; Transvaal Plant Import Regulations (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller reports for the month ending February 20th:—

Wool.—A fair quantity has been sold during the month, consisting principally of Karoo parcels. The tendency is for lower prices, which is more particularly noticeable in heavy wasty wools. Good clips of light Karoos are in good demand. Coarse and coloured are eagerly competed for, and up to 5d. has been paid for Grease parcels. A few lines of Grassvelds were offered, but their condition was rather poor, and 8¾d. was the highest price bid. Scoured Wools are in strong demand, and prices are firm, up to 1/9 having been paid.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld Wool	0	8	0	9	Short and Inferior ..	0	4	0	5
Super Long Karroo Veld Wool	0	6¾	0	7¾	Wool for Washing ..	0	4½	0	6
Medium Karroo Veld Wool	0	5	0	6¼	Snow-white Super to Extra	1	4¾	1	9
					„ Ordinary	1	2	1	5
					Fleece Washed ..	0	9	0	10

Ostrich Feathers.—The London Sales closed on the 10th inst. Compared to last Sales, Whites common, Dark Feminas, Fancy and Drabs were about 10 per cent lower, Blacks 10 to 20 per cent. lower, Third Whites 10 per cent, higher, Mid and Short Drabs 10 to 20 per cent higher.

	£	s.	d	£	s.	d		£	s.	d.	£	s	d.
Super Primes	10	10	0	35	0	0	Floss ..	0	5	0	1	10	0
Firsts, Ordinary to Super ..	8	0	0	10	10	0	Long Drabs ..	2	10	0	4	10	0
Seconds ..	6	10	0	7	0	0	Medium Drabs..	1	5	0	1	15	0
Thirds ..	3	10	0	5	0	0	Short to Medium	0	10	0	1	10	0
Femina (super)	7	0	0	10	10	0	Floss ..	0	2	6	1	10	0
Femina, Seconds to Firsts ..	4	0	0	6	0	0	White Tails ..	1	5	0	1	15	0
Byocks (fancy) ..	5	0	0	7	10	0	Coloured Tails..	0	5	0	1	10	0
Long Blacks ..	4	10	0	7	10	0	Chicks ..	0	1	0	0	2	0
Medium Blacks	3	0	0	3	10	0	Spadonas ..	0	10	0	4	0	0
Short to Medium	0	10	0	2	10	0	Inferior Black & Drabs, Short to Long ..	0	0	6	1	10	0

Mohair.—The market remains firm. All classes are in strong demand at late

	s.	d.	s.	d.		s.	d.	s.	d.
[illegible]	0	10	0	11¾	Mohair Winter	0	10	0	10¾
[illegible]	1	3½	1	4	Kids..	1	0	1	2
	0	6½	0	9¾					

[illegible]—There is no change to report; all classes are eagerly competed for. [illegible]

	s.	d.	s.	d.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	s	d.	s.	d.
Cape Skins sun each	0	0	1	0
Goat Skins, heavy to light ..	0	8½	0	10
[illegible] ..	0	0	0	[illegible]
Angoras ..	0	4½	0	[illegible]

PORT ELIZABETH.

Messrs John Daverin and Co., report under date, January 13:—

Ostrich Feathers.—The market was only lightly supplied this week, the sales lasting two half days when the usual average assortment was offered. Competition was fairly general, and all descriptions brought full prices, except long and medium blacks and drabs, which were fully five per cent lower. Stocks continue small and new arrival limited, and it is very doubtful when we may expect much increase in the supply, certainly not for another month. The total quantity sold on the public market this week amounted to £2,962 10s. 0d. and weighed 188 lbs 6¾ ozs.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes : Extra super				Special Prices.			Blacks : Long.	3	5	0	5	0	0
Good to super	10	0	0	12	0	0	Medium ..	1	7	6	2	12	6
Whites : Firsts	6	10	0	9	0	0	Short ..	0	10	0	1	0	0
Seconds ..	4	10	0	5	10	0	Wirey .	0	1	0	0	1	6
Thirds ..	2	10	0	4	10	0	Floss ..	0	6	0	1	1	0
Feminas : Tipped							Drabs : Long ..	1	12	6	3	0	0
and Grey ..	5	0	0	7	10	0	Medium ..	0	15	0	1	7	6
Seconds ..	2	5	0	4	0	0	Short ..	0	2	6	0	6	0
Thirds ..	1	7	6	2	5	0	Wirey ..	0	0	6	0	1	0
Fancy ..	4	5	0	6	10	0	Floss	0	6	0	1	1	0
Tails : White ..	1	7	6	2	10	0	Spadonas : Light	1	0	0	3	0	0
Light ..	1	0	0	1	10	0	Dark ..	0	12	6	1	12	6
Coloured & Dark	0	5	0	0	15	0	Chicks ..	0	0	3	0	1	6

Wool.—This market remains dull, and the amount of business done in the open market during the week was smaller than it has been for the past three months. There is a fair demand for light, well conditioned parcels, but we regret to say that the wools arriving during the past few weeks have been decidedly heavier than they were during the earlier part of the season. This chiefly accounts for the depression. On yesterday's public market 269 bales were offered, of which only 52 bales were sold. The bulk of the offerings consisted of heavy and wasty lots, for which there was little competition, hence the large withdrawals.

Snowwhite Extra Superior ..	17½d	19d
Snowwhite Superior ..	16d	17d
Do Good to Superior	14½d	15½d
Do Inferior Faulty	13¼d	14d
Grease, Super Long, well-conditioned, Grassveld grown, special clips . ..	7½d	8½d
Grease, Super Long, well-conditioned, Grassveld grown ..	6¾d	7½d
Grease, Super Long, well-conditioned Karoo Grown ..	6d	6¾d
Grease, Super Long, well-conditioned, Mixed Veld ..	6d	6¼d
Grease, Light, faultless, medium, Grassveld grown.. ..	5¾d	6½d
Grease, Light, faultless, medium Karroo grown	5¼d	5¾d
Grease, Light, faultless, short Karroo grown	4¾d	5d
Grease, Short, faulty and wasty ..	4½d	5d
Grease, Coarse and Coloured ..	4¾d	4⅞d
Scoured, Coarse and Coloured ..	6½d	10½d
Free State Grassveld Grease, long and well-conditioned ..	6½d	6¾d
Free State medium grown, light, with little fault ..	5¼d	5½d
Free State short, faulty and wasty	4¾d	5d
Free State Karroo grown, long and well-conditioned ..	5¼d	5¾d
Free State medium grown, light, with little fault ..	5d	5½d
Free State short, faulty and wasty ..	4½d	5d

Mohair.—There is nothing new to report in this market. On the public market this week 18 bales were offered, of which 6 bales were sold at unchanged prices.

Kids, superfine	1s	4½d	1s	6d	Mixed Hair	0s	9½d	0s	10¾d
Kids, ordinary	1s	2½d	1s	3d	Seconds and Grey	0s	7d	0s	8½d
Kids, seeds and mixed	0s	9½d	1s	0d	Thirds .	0s	4½d	0s	4¾d
Superior Firsts	None offering				Winter .. .	0s	11d	0s	11¼d
Ordinary Firsts	None offering				Do Kids ..	1s	0d	1s	1d
Long Blue O R C Hair	None offering								

Skins.—Sheepskins sold in bundles at 6¼d per lb., Pelts at 4d, Capes, 1s 6d, damaged, 6d each, Angoras 5¾d. Shorn, 4¼d, damaged, 2¾d, Goat, 10¾d. damaged, 5d per lb. Springbok 8d each.

Hides.—Sun dried Hides sold this week at 7¼d, and for damaged, 6d, Drysalted, 7d, damaged, 5¾d and Thirds, 3½d.

Horns.—Parcels all round sold at 3d each.

THE

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CONTENTS.

PAGE.

NOTES— 502—508
To Secretaries of Farmers' Associations, &c.—Osteo-Porosis—Tick Eradication—Cape Fruit in London—Sale of Grafted Vines at Tokai.—Death of Mr Armstrong, M.R.C.V.S.—Grapes in Cold Storage—The Non Prickly Pear—The Show Season—The Country Shows—Bathurst Show—Bredasdorp Show—Riversdale Show—Ceres Show—Barkly East Show.

FARM AND VELD—(*Illustrated*)— 509—516
Hand Weaving Wire Fences to make them Vermin Proof—Irrigation—Post-mortem Appearances in Arsenical Poisoning—The Action of the Internal Organs of Ruminants—The Poisonous Senecio, or Ragwort—Failing Orange Trees—Failing Pear Trees—Ant Heap Soils.

EXTRA-TROPICAL FORESTRY, by D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town (*Illustrated*) ... 517—527
THE USE OF LIME IN AGRICULTURE, by J. Lewis, M.A., Government Analyst 528—532
EXPERIMENT STATIONS—THE EXPERIENCE OF CANADA ... 533—539
OSTEO-POROSIS, by the Chief Veterinary Surgeon (*Illustrated*) ... 540—553
WESTERN PROVINCE AGRICULTURAL SOCIETY—THE 1905 SHOW (*Illustrated*) ... 554—577
THE SOUTH AFRICAN HORSE, by a South African Breeder ... 578—580
OUR MEAT SUPPLY, by P. J. du Toit ... 581—594

RUST IN WHEAT ... 595—596
SEEDS FOR DISTRIBUTION ... 397
TYPICAL AFRIKANDER RAM (*Illustrated*) ... 598
SOUTH AFRICAN STUD-BOOK ... 599

CORRESPONDENCE— 600—611
Locust Destruction—Scab in Sheep and its Eradication—Mealies after Turnips—The Working of Syphons—"Jumper v. Diamond Drills"—Planting Prickly Pears to Prevent Sluiting—The Jointed Prickly Cactus—The Points of Persian Sheep—Mules Killing Foals—Loose Teeth in Cattle—Tapeworm in Pigeons—Alleged Caterpillar (Intonjani) Poisoning—A Freak of Nature—Sluiting and its Causes—Vermin on Fowls—Irrigation Queries—A Fuchsia "Sport"—Saltbush, Lucerne, &c.—The Ploughing of Land.—Mangels *v.* Green Oat Silage for Milk Production—Destroying Ticks on Stock: Interesting Experiments—Lime and Sulphur Dip—Lime and Sulphur *v.* Imported Dip—Mr. Timson in Reply.

RURAL REPORTS ... 612—614
NOTES ON THE WEATHER OF FEBRUARY, 1905 ... 615—618
RAINFALL RETURNS FOR FEBRUARY, 1905 ... 619—621
CURRENT MARKET RATES ... 622
DEPARTMENTAL NOTICES ... 623—628
DEPARTMENTAL PUBLICATIONS ... 629—630
THE PRODUCE MARKET ... 631—632
INDEX TO ADVERTISERS ... lxvii—lxviii

NOTES.

To Secretaries of Farmers' Associations, &c.

Will Secretaries of Farmers' Associations and Agricultural Societies, who have not already done so, please send replies to the following questions to Dr. Nobbs, Agricultural Assistant, Department of Agriculture, Cape Town?

(1) The number of members comprising the Society.

(2) The branches of agriculture generally occupying the attention of the Society.

(3) Any special aims of the Society other than the general furtherance of agricultural pursuits in the district.

(4) The rules and regulations promulgated by the Society.

(5) Whether notices and dates of meetings can be periodically furnished to this office.

Osteo-Porosis.

The obscure bone disease in horses, known as "Osteo-porosis," forms the subject of an exceedingly interesting, thoughtful and exhaustive article in this issue. The Chief Veterinary Surgeon (Mr. D. Hutcheon, M.R.C.V.S.), the author of the paper in question, has had a good deal of experience with this disease, and he now gives in detail the conclusions he has arrived at. It is satisfactory to know that an authority so fully qualified to judge, disagrees with the theories propounded by Capt. Lane, of the Army Veterinary Department, who maintains that one of the main causes of the disease is the insufficiency of lime-phosphate in Colonial grown oathay. There should be little need to pile up arguments in refutation of such a theory for the very essentials of the case condemn it. Mr. Hutcheon gives many excellent reasons against, and there are others which will occur to any student of the subject. A deficiency of lime-phosphates in our soils would show much sooner in the crops than in the animals that feed on them. Without lime-phosphates cereal crops are a failure, as most Western farmers know to their cost—for that is why they are put to such heavy charges for superphosphates. However it is as well the question has been raised, as it is one of great interest and we feel sure that all interested in horses will study with care the article herewith on "Osteo-porosis."

Tick Eradication.

Messrs. Cooper & Nephews, the well-known firm of sheep dip manufacturers, have, with commendable enterprise, purchased some notoriously tick infested properties near East London, with the object of carrying out experiments for the eradication of ticks.

Major Timson, the representative of the firm, says that they intend practically demonstrating the possibility of every farmer mastering ticks and tick troubles in stock and restoring sheep to veld on which they cannot now exist. The Farmers' Congress on being informed by telegram of the project extended hearty thanks and approval of the scheme and hoped it might prove thoroughly successful.

Cape Fruit in London.

Messrs. Hudson & Son, writing on February 11th from London, report:—Judging from the fruit we have received this season, we must say that we consider the turning point has been reached, and everything goes to prove that shippers at last have realised the necessity of sending only the best stuff, well packed; but we think it just as well to utter a word of warning to this effect, that the high prices that we are able to make at the moment for the fruit, should not be taken as a basis, for it is only the limited supplies coming forward that make it possible to obtain these prices, but so long as the fruit arrives sound and good, as it is now doing, we feel sure it will pay the shippers. It may be of interest to state here, that English white hothouse grapes were making 20s. per lb. this week, this was really due to the fact that there were only a few baskets available for the London market. Whilst on the subject of grapes, those from the Cape that are now on their way should do very well and pay the shippers, as English grapes are practically over.

Sale of Grafted Vines at Tokai.

Attention is directed to the sale, announced in our business pages, of grafted vines at Tokai. The vines are looking splendid, and it will be seen from the notice that a large number of choice varieties of table grapes are to be offered for sale. The Sultana vines are specially grafted for the Worcester and other districts that make a speciality of raisins.

Death of Mr. Armstrong, M.R.C.V.S.

All his colleagues and many farmers in the Graaff-Reinet, East London and Aliwal North districts, will learn with regret and sorrow of the death of Mr. Harry Tennison Armstrong, M.R.C.V.S., at the time of his death District Veterinary Surgeon, residing at Aliwal North, Cape Colony. He came to this country in 1895, and was attached to the Government Veterinary Department during the spread of Rinderpest in Bechuanaland. He was afterwards lent to the Imperial Government and conducted the campaign against that disease in Basutoland. He was subsequently stationed at Graaff-Reinet where his work in connection with Rinderpest and parasitic diseases of ostriches, more especially his experimental dosing of these birds for wire-worms will be well remembered by residents in the district, where his genial character, kindly disposition and high professional abilities made him a general favourite. During the last recrudescence of Rinderpest in this Colony, Mr. Armstrong was placed in charge of the Serum Station at Aliwal North where his good work and intimate knowledge of the subject were of the greatest value to the Colonial and military authorities. Mr. Armstrong was a keen, earnest and indefatigable worker at his profession and did good service in the combat against infectious disease. He was a good friend, an entertaining companion and one of the most charming *raconteurs* it has been our pleasure to know, and we deeply regret his early decease at the age of 37.

Grapes in Cold Storage.

Mr. C. A. Pfeiffer, of Timour Hall, has just completed some experiments in packing grapes for shipment, which go far to prove that there is a great future in this particular industry for the viticulturists of the Cape. The Hermitage grape is not usually considered to be a variety suited to shipment, and as this was the grape selected for trial the test was the more severe. Mr. Pfeiffer packed several cases on the 24th of February, and placed them in the Dock cold store. He took them out on the 21st of March, and the fruit in the one opened in our presence was in excellent condition. Each bunch was as firmly set as freshly picked grapes, the berries were full and in no case shrunk, while the flavour was perfect. The stalks even were quite green and had lost none of their freshness, and not even the bloom was damaged. In a word, the experiment was a complete success, and with care and attention, there is no reason why it should not be equally successful on a commercial scale.

It has to be remembered, of course, that Mr. Pfeiffer has devoted a great deal of time and attention to the packing of grapes for export. And it is, undoubtedly, largely due to his methods of packing that the experiments have succeeded. The case opened in our presence was an ordinary half one, the top and bottom being so set on that a ventilation strip runs the length of the box. At each end four vent holes, about ½ inch each, were bored, and the top battens, instead of being in one piece each, are cut in two, leaving a space in the middle to assure a circulation of air. In this box 12 lbs. weight of ripe grapes were packed, with plenty of wood wool to keep them from touching as far as possible. The test includes a trial shipment packed in the same way and sent to England by the *Saxon* on March 1st. Mr. Pfeiffer now awaits the result of that shipment with a certain degree of confidence, and it will be interesting to have the report. To make assurance doubly sure, Mr. Pfeiffer has tested cases week by week in the cold store here, so that he is fairly positive of his lines of procedure for the future. He claims that the secret of success lies not only in the packing, though that has a good deal to do with it, but in careful cultivation and selection. We trust to be able to publish the report on the trial shipment in our next issue.

The Non-Prickly Pear.

Mr. F. Beswick, Curator of the Queenstown Botanic Gardens, draws the attention of stock owners to the value of the smooth-leaved opuntia or prickly pear, which is known in the Colony as Kaalblad. He says:—"Could not this spineless, smooth-stem opuntia be a most useful fodder plant for our farmers to grow and have as a stand-by in seasons such as we have been having for the past three years? Look at the tons and tons of food an acre of it would produce with no trouble of culture. It was this I had in view when I brought the cutting from Cape Town. I may be wrong. There may be something about the plant I do not know of which would prevent it being so used; but when famished beasts will attack the common kind, also the so-called American aloe with its hook-like spines, I think it would be worth while for our farmers to give this plant a trial. I need scarcely say I shall be pleased to show it to farmers, and supply them with as many cuttings as my plants will allow of."

He also calls attention to the reports of the latest achievement of Mr. Luther Burbank, who is said to have propagated a never-fading flower and cactus leaves as soft as silk. The report in question reads as follows:—"Wonderful as is the discovery of the never-fading flower, which was announced by cable from San Francisco the other day, it is not the greatest or most serviceable work performed by the gentleman to whose patient study the new blossom is tribute. Mr. Luther Burbank, whose great knowledge of botany and horticulture enables him to produce many valuable and floral wonders, is the proprietor of a remarkable and perfectly-equipped system of nurseries at Santa Rosa, California, where for some years he has been known as the botanical wizard because of his development of stoneless plums and other similar improvements in fruit. His discovery of the non-fading flower, mentioned in the cables, is interesting more as a curiosity than for the benefit it confers; but news has just been received in London of a much more important achievement of Mr. Burbank which will confer a lasting blessing on many countries. This is the production of a 'spineless cactus,' which is nearly as nutritious as alfalfa, and will yield more forage to the acre. After ten years of work by means of a series of crossings and re-crossings of different varieties from different parts of the world, Mr. Burbank raised a spineless cactus, and is now endeavouring to make the plant hardy and more prolific in fruit and leaves. He has at his experimental grounds, specimens of a cactus which he has robbed of thorns, having brought the leaves to a state of perfection in which a man can rub the leaves over his face without receiving a scratch. The leaf surface is described as being as soft as silk."

It must be a wonderful cactus if it is "nearly as nutritious as alfalfa." Our old friend, the Kaalblad variety of prickly pear, growing in the Botanical Gardens, Cape Town, and well known in the Karroo and Midlands, equals the other virtues claimed for this discovery, and it is a good stand-by fodder as well.

The Show Season.

April brings the Agricultural Show season to a close, so far as the important centres are concerned. We note that the St. Mark's Agricultural Society announces a Show to be held at Cofimvaba on May 5th, and that will be the very last of the series. During April the great show at Port Elizabeth will be held, opening on the 5th and continuing on the 6th and 7th. The Kokstad show will also be held during the first week in the month.

March has proved a particularly full month for show fixtures. The grand function at Rosebank was followed by three other successful Western shows. Riversdale was *en fete* on the 2nd, Ceres on the 10th and Caledon on the 23rd. In addition to these, Barkly East held a good show on the 17th and the annual two-day fixture of the Albany Agricultural Society was set down to be held at Grahamstown on the 30th and 31st, Of the latter we have no information for this issue, as it had to be sent to press before that date to ensure publication on the first.

The Country Shows.

The most interesting feature of the show season this year has been the increasing number of district fixtures which have been held, and as these are of great educational value we trust to see them continue in the future and their number grow even greater. What with the drought and the depression, it must be a serious undertaking for any local body to commit themselves to the onerous task of running a district Agricultural Show in the more sparsely populated centres, for they cannot rely on outside attractions to draw a crowd and thus ensure a big "gate" We have been compelled to regretfully chronicle the dropping out of such important centres as East London, King William's Town and Bloemfontein, while others like Queenstown and Aliwal North gave up the attempt from the beginning. All this reflects the greater credit on those centres which have manfully struggled to stick to their engagements, more particularly the smaller ones, and we must all wish them every success in the future.

Bathurst Show.

Bathurst is such a highly productive district that it is not at all surprising to hear of a successful show in that part of the country. It is seriously handicapped in one sense by being so near to Grahamstown, but that does not deter the Committee, under the energetic presidency of Mr. P. J. Ansley, of Trappe's Valley, from putting forward an attractive schedule. The show was held on the 18th of February, the strong feature being a magnificent display of fruits which could not be equalled except in the Western Province. The vegetables and produce were also very good, while the stock included some excellent specimens for slaughter purposes. Horses, ostriches and poultry were also well spoken of. The display of implements was small, which is to be regretted as many farmers attend a show like this who never get the chance of attending the larger fixtures, and as a consequence have not the chance of discriminating much as to the class of implement they use.

Bredasdorp Show.

Bredasdorp is one of the less important centres which has made an excellent display this year. This show was held on February 16th in excellent weather. The prize schedule totalled to the respectable figure of £400, and the competition was keen in most of the classes. The features of this show were the stock and produce. The former included a fine exhibit of horses—particularly in the breeding classes. Cattle, sheep and goats were also an excellent lot, some of the merinos being very highly spoken of. It is encouraging to learn that ample though the accommodation provided was supposed to be, it has been found necessary to erect another large building to house the exhibits. The Bredasdorp folk will find no better investment for their money than will be returned by a generous support of their local Agricultural Society.

Riversdale Show.

Riversdale Show, held on March 2nd, attracted some very excellent entries, especially in the horse section. The young Colonial-bred stallions were a very fine lot indeed, an Arab, "Sultan," owned by Mr. Mackenzie, attracting a great deal of attention. It certainly looks as though this district is determined to retrieve its lost laurels as a horse-breeding centre and shew the country once more what it can do in this direction. The cattle were a little disappointing, but the sheep, especially the merinos, would have gained credit on any show-ground. Riversdale has advanced far with its woolled stock of late and it is to be hoped this movement will continue. This show must have opened the eyes of a good many as to the potential wealth of this district. Riversdale is evidently strong in stock.

Ceres Show.

Ceres held its first show for some years on the 8th of March, which attracted a goodly array of entries and a fairly good attendance. Fruit was a strong feature here, particularly the apples and pears for which the district is so well suited. There can be little doubt as to the future of this section of the farming industry of the district if the people will develop it on right lines, and easy communication is obtainable. The horses were a good lot, except in the breeding classes in which there was not sufficient competition to please the judges. The young stock, however, was excellent, and drew many a compliment from all. The cattle were disappointing, and so were the sheep and goats. Ceres should be able to do much better in these sections. Mr. J. Gray, of Waverley was complimented by the judges on his Herefords (bull and cow) and Lincoln ram. The fruit judges were satisfied considering the lateness of the season. Pears and apples, they remarked, for which this district is specially well adapted, were certainly a most creditable exhibit, and some samples shewn were most excellent types of what can be grown there. This class of fruit should be more extensively grown and marketed when top prices would be realised. Melons of the several types were also well to the fore.

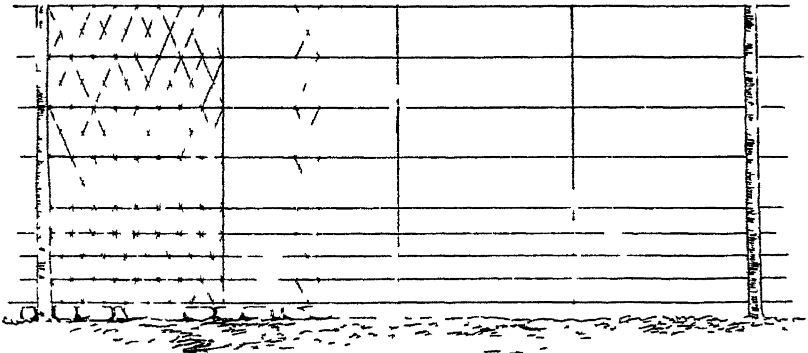
Barkly East Show.

The Barkly East Show held on March 17 is very highly spoken of. Nearly 400 entries were received, and the competition in some classes was reported to be particularly keen. A splendid lot of sheep were exhibited, Messrs Botha and Gardner being the principal prize winners, Mr. Botha taking the cup presented by Mr. Mosenthal. The cattle were the strongest feature in the show, Mr. Powrie, M.L.A., securing champion prize for bulls, as well as several other prizes. Some of the horses were exceptionally fine animals. In this class Messrs. Orpen & Son took most of the prizes. Machinery, agricultural implements, carts, wagons, etc., were strongly represented. Malcomess & Co. led easily. The display was greatly admired, and practically the whole of their exhibits were sold in the show-ground. Mr. Symons, of King William's Town, and Mr. Morrison, Aliwal North, also received awards.

FARM AND VELD.

Hand Weaving Wire Fences to make them Vermin Proof.

Mr. Sydney Hobson, of Stockdale, Aberdeen Road, writes:—Vermin proof fencing is now having a good deal of attention from our farmers and I dare say many will be glad to know that fences already erected can be treated in this way, and at a less cost per yard than covering them with wire netting. I have done some of this kind of work on my farm and it is satisfactory, making a nine-wire fence, vermin proof. I think even a seven or eight wire fence could be successfully treated. I may here say that I am also using the Kitselman machine and this is the cheapest method of making a vermin proof fence; but this machine cannot be used on old fences already erected and it is here where I see hand weaving is useful. Hand weaving is much stronger than any netting attached to a fence being woven into it. I shall be pleased to give any further information in the subject if so desired.

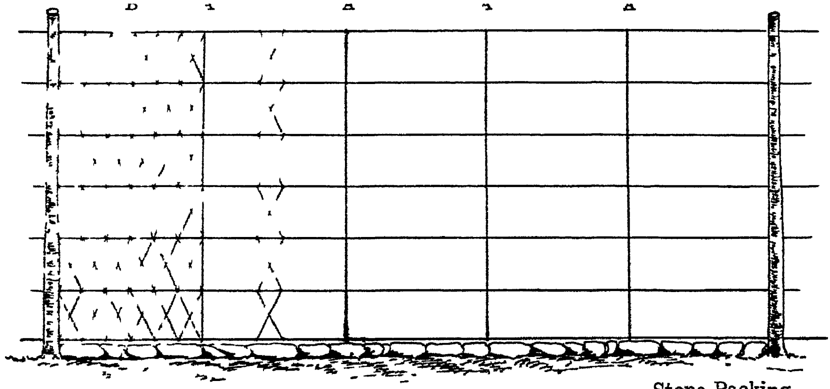


The above figure represents a section of a nine-wire fence with double lacings A A A every yard on which Hand Weaving B has been done, using No. 16 galvanized wire so as to make it Jackal Proof.

The No. 16 wire is cut in lengths a little longer than the height of the fence and put on every 3½ in or 4 in, two men work best together and can do about 33 yds. a day or 100 yds. in 3 days, thus the labour costs about 12s. per 100 yds. and the wire about 16s. per 100 yds. so a fence can be made vermin proof at a cost of about £1 8s. per 100 yds, or £14 per 1000 yds. It makes a very substantial job of an old fence and saves altering and pulling it down. Before starting, the old fence must be properly strained up and lacings well tightened as the lacings keep the fence from drawing about, when the weaving is put on.

The process is very simple, each little lacing is crossed in the middle and then two turns are given in the horizontal wire, and so on till the lower wire is reached.

The weaving if properly done cannot slip. If a seven wire fence is to be dealt with it would be as follows:—See figure No. 2.



Irrigation.

On Irrigation "Apex" writes:—How shall we make a start? An entirely new irrigation law has been suggested as a *sine qua non* of irrigation, but if we can be guided by the experience of other countries let us note that no less an authority than the Chief of the Hydrographic Department of the United States, writes:—"There is a general opinion in America that those States which have aimed at an ideal irrigation law right away, have retarded irrigation, while the States which have made irrigation laws only to redress a grievance when such has been proved to exist, have progressed most." In Spain, which is sometimes held up to us as an example, let us observe that the law plays quite a secondary part, for the irrigators on each stream combine to form local irrigation boards and practically "run the show" and arrange everything among themselves. This they do after they and their ancestors before them, have had over four hundred years experience of irrigation; for be it remembered that it was in the time of the Moors that some of their irrigation works were constructed.

We must combine locally and help ourselves and control everything ourselves locally; this is the key-note of success of many of our irrigable areas, but later on when we have carried out all works such as individuals can undertake; then we may need Government to construct the larger ones. Our chief requirement to day is the best professional advice free. Make it accessible to everyone without cost to them and without its being bound up in red tape. Money is scarce in our country and we all need to be taught to get the best value for it and. where we are purchasing irrigation experience, it is Government alone who can supply the best professional advice. We want more men who have had the best technical training as hydraulic engineers and who have had good experience on irrigation works in other countries but they must be spread about the Colony where farmers can get at them, and get to know them and so gain confidence in them, while the engineers are acquiring local knowledge.

In fact we want district hydraulic engineers, the districts could be large at first while there is little doing, but later on, as individuals undertake more works with the help of these engineers, the districts would have to be cut up into smaller ones and more engineers employed. A few really first class men, each in a moderate sized district where he could get to know the farmers and wear off their aversion to his class, would work wonders in a year or two, but his services must be gratuitous until he has gained their confidence. Few farmers will pay for his services to day. We who mix with the farmers, are aware how differently they look upon us when we know them well and can explain the why and wherefore of our actions and point out true principles in every day language. Government District Hydraulic Engineers are the first steps to self help and irrigation.

Post Mortem Appearances in Arsenical Poisoning.

A correspondent writing from Heilbron, O.R.C., asks to be informed as to the most likely *post-mortem* appearances in an ox which had died from drinking Cooper's Dip mixed in water ? Also the amount of raw Cooper's Dip likely to poison same ? In the case he refers to he could find little or no inflammation of the organs.

The usual *post-mortem* appearances which are observed in cattle, when poisoned by drinking a soluble arsenical compound such as Cooper's Dipping Mixture are :—More or less intense inflammation of the lining membrane of the fourth stomach or "Melk-pens," and patches of inflammation more or less extended of the mucous membrane of the bowels. But very frequently, when an animal swallows a large dose of the poison in a soluble state, death may follow so rapidly that these local inflammatory lesions have not had time to develop.

The dose sufficient to kill our domestic animals varies. I have known a teaspoonful of powdered white arsenic given to a horse with impunity, and I have seen a horse poisoned with a less quantity when given in complete solution. Anything over 10 grains would be dangerous to sheep. And 30 grains and over would be equally dangerous to horses. Full grown cattle usually stand larger doses but 60 grains in solution would be very liable to produce fatal gastro-enteritis. The *post-mortem* lesions are more pronounced when the dose has been small and the animal lives two or three or more days.—D.H.

The Action of the Internal Organs of Ruminants.

W. Glynn, writing from Dewetsdorp, O.R.C., says:—Within the pages of your February *Journal* I read with great interest the letter written to you by C. E. Pohl, *re* the finding of a piece of rusted wire in the heart of a heifer of his, asking for an explanation, which the Chief Veterinary Surgeon very ably gives. Being a cattle farmer of the Old "Tak Haar" stamp, but luckily very inquisitive and willing to learn, I would feel very grateful to the Chief Veterinary Surgeon if he will answer the following questions as definitely as possible:—

1. Where will liquid lodge when swallowed in gulp by a ruminant, bull, ox, or cow?
2. Does the liquid extracted from the cud of these ruminants, when swallowed, lodge in the same stomach as that gulped?
3. Does any foreign body, such as bone, nail, screw, wire, etc., etc., when swallowed, pass direct into the paunch (fermenting stomach)?
4. Is it possible for any of the abovementioned foreign bodies, when swallowed, to pass direct into the klein pens (second stomach) and lodge there?
5. Has the big paunch (fermenting stomach) any direct intercourse with the second and smaller one called the klein pens?

I shall ever remain grateful to you and the Chief Veterinary Surgeon for definite replies to these questions, which will greatly aid me to understand more than I do at present *re* the natural action of the ruminant's internal organs.

The Chief Veterinary Surgeon (Mr. D. Hutcheon) supplies the following answers:—

1. It was the general opinion formerly that fluids passed directly and entirely into the third and fourth stomachs—(blaar-pens and melk-pens)—of ruminants, when the animal drank, or when fluids were poured *slowly* down their throats. But Flourens proved by making fistulous openings into all four stomachs, that immediately on drinking, fluids enter *all four* stomachs almost simultaneously. It is very evident that the largest portions of fluids and soft foods enter the first two stomachs, otherwise it would be impossible to account for the quantity of fluid which is invariably found in these two compartments, especially the second, as they are but sparingly supplied with glands, and, therefore, incapable of furnishing a secretion of their own. Besides, the act of rumination could not be performed unless the first two stomachs contained a certain quantity of fluid. The rumen forms the cud and forces it up to the opening of the œsophagus, where the reticulum or second stomach, which always contains fluid, contracts and forces up a quantity of fluid along with the cud. Anyone who listens closely beside a beast as it ruminates can easily hear the sound of water as it ascends the œsophagus, and the moment that the ball of food is grasped in the mouth, the fluid will be heard to rush down the œsophagus again

into the first and second stomachs. It will be seen, therefore, that the greater portion of the fluid which is drunk and the fluid pressed out of the cud in the mouth enters the first and second stomachs. This answers questions 1 and 2.

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3. Does any foreign body, such as bone, nail, screw, wire, &c., when swallowed, pass direct into the rumen or paunch? Yes, these foreign bodies all pass into the rumen, but by the muscular contraction of this compartment, which forms the cud and forces it up towards the second stomach to enter the œsophagus—such substances become lodged in the second stomach (*reticulum*). Further, the opening from the second stomach to the third or leaf stomach is narrow, and guards against the entrance of coarse food or any foreign substances such as above mentioned by Mr. Glynn. This explains why such foreign bodies are usually found in the second stomach, and from which they are so liable to pass through its wall and the diaphragm, which is in immediate contact with it, into the organs of the chest. This answers question 4 also.

With respect to the relation of the first and second stomach. They are so intimately related that in some ruminants they are more like different compartments of the same stomach than separate and distinct stomachs, with different functions.

The Poisonous Senecio, or Ragwort.

"Mac," writing from Macleantown, asks: Can you please give me a description of the Seniciones or Ragwort. Is it a bulb? The Cattle about here die periodically of some mysterious sickness which is now generally put down to poisoning, and a neighbour of mine pointed out some bulbs which, he said, an old transport rider had told him were the cause of it. I promptly instituted a search in the paddock where my cattle (which had been dying) feed, but only found a very few of the same kind of bulb, and the leaves were untouched; so I came to the conclusion that they were not the cause of the mischief. I would be very glad to start a crusade against weeds, if only I could find out which are harmful, but it would take two or three life-times to eradicate all the weeds on even a small farm.

Prof. MacOwan, the Government Botanist, supplies the following note on the above:—As there are one hundred and eighty sorts of *Senecio* in South Africa, and many of them are as like as two peas, a verbal description of any particular one has no chance of recognition. Perhaps "Mac" knows the great ragged weed which comes up often in stubble-land, filling it two feet high with its perplexed, criss-cross, herbaceous branches, each with an umbel of staring yellow star-flowers at the top. The stems and leaves are more or less cottony on the surface instead of a clean wholesome green. I have heard it called "Tack Luis-bosje. Well! that is a

Senecio, and if you know it, you will have something to go by, and can more easily understand what the European "Ragwort" is like, and what the weeds now believed to bring on illness in cattle are like.

Failing Orange Trees.

"Orange Tree," writing from River Zonder End, asks to be told what to do for some failing orange trees. They are all seedlings about twelve years old, and until lately they did very well. At eight years old they began to bear, and did fairly well, though every now and then they had to be dressed for scale with lime and sulphur. Now they are nearly clean, but the oranges are falling off, some of the branches are dying away, and on others the leaves are yellow. They are irrigated when dry. The soil there has no lime at all, and is that the want? If we think so, would we please tell what we would advise as best to give—some of the minerals or phosphates advertised, and if so, what quantity to each, or if shell lime would be good?

It is difficult to give advice worth anything in a case like this without seeing the trees and their surroundings. The symptoms described point to mischief at the roots; particularly the dying bark of the young wood. In most cases this mischief is due to injudicious irrigation following on the system of planting the trees in holes dug out of soil otherwise unbroken. Suppose this done: every tree is situate on a few cubic feet of soft, pliable earth, and round its roots are the hard, dense walls of the original hole. Clearly, it might almost as well be in a wooden box, for the roots will not force their way into their hard surroundings. The irrigation water is run into a small basin made round the collar, and is (often) allowed to flow till the hollow is full and remains full. This can only be the case when the whole cubic content of the planting hole is brimful of water, the earth completely soaked, and all the air driven out from the interstices of the particles. Perhaps this is done several times a week. Now roots require air, breathe, in fact, and such treatment as the above deprives them of air for many hours together. Then they are stifled and die, the fibrous end-threads perishing first. These root-tips are the only parts of the roots that absorb moisture and food material from the soil; hence it is easy to see how their death is followed by the languishing of the young wood and leaves.

Not to make too long a story, this is what I should suspect to be the matter in correspondent's case. The course to be taken, supposing the surmise to be correct, will be to ensure free underdrainage to the trees by taking out a narrow trench, three feet deep, about five feet distant from the trunks, and carried down the natural slope of the plantation. If this be filled fifteen inches deep with round pebble stones, and a stratum of takkies laid a-top before filling up, this "French drain" will carry off any surplus irrigation water and suck in air with the last of the moisture. If the planting had been done properly, by first *trenching* the ground, say, two-and-a-half feet deep, down the slope, before putting the trees in, they would have had their demand for drainage supplied from the first. I have never known orange trees go wrong from root-troubles when this common-sense system has governed the mode of planting. See pp. 8-14 in the *Manual of Orchard-work at the Cape,* where these matters are treated more fully; also p. 85 on the root-system of the orange especially.—P. M. O.

Failing Pear Trees.

Mr. C. S. Manning, writing from East Griqualand, says:—Two years ago I bought a number of grafted fruit trees, amongst which were 25 pears (five varieties). All the trees have done very well indeed, with the exception of these pears. They grew a little the first season, but this year have hardly moved, and quite half of them have died or look like dying. All the leaves have fallen off, and I notice that from some of the roots quince shoots have come up. Should I root up these trees, or are they likely to recover? They have had the same treatment as the apples, peaches, plums, apricots, &c. The soil here is a very deep red or chocolate soil on a good slope.

The most probable cause of the failure of these pear graftings is that they are comparatively new sorts, whose behaviour upon quince stocks has not been tested. Correspondent does not give the names received from the seller. The following quotation from my *Manual of Orchard-work* will explain this possible reason for failure.

"Allusion has been made to the dislike which some fine sorts of pear seem to show to the quince stock, and the consequent difficulty of getting a perfect union. This is particularly marked with the Jargonelle, with Marie Louise and Bergamot Gansel; less distinctly with Beurré Clairgeau, Beurré Rance, and Beurré d'Angleterre. As a general rule, cleft-grafting has a better chance of success in these cases than simple budding. But the more satisfactory procedure is that of double-grafting. Upon the quince stock is first worked a vigorous pear sort which takes kindly to it. After perfect union and sufficient growth, generally two years, the pear shoot is headed back and made to carry the bud or scion of the desired variety. Thus the vigorous Beurré d'Amanlis makes a most perfect intermediary between quince and Jargonelle and the two others above named. Other strong-going sorts—*e.g.*, Beurré Hardy, Vicar of Winkfield, Beurré Noisette, Jaminette, Beurré Vert—may be used to carry more tender or more fastidious pear varieties, which, even if they make a sound, direct union with the quince stock, are thereby rendered slow of growth."

I think these results of experience probably cover the difficulty which correspondent has experienced. Reference should be made to the nurseryman selling the graftlings, and the names of the sorts with identification of the stocks procured. I recommend also careful study of the article on the Pear, in the little manual from which comes the above quotation. No fruit can compete with the Pear, and none repays careful culture so bountifully. The lagging growth might perhaps be assisted with a top dressing of lime, if that ingredient be scanty in the natural soil. After several months interval, a little wood ash, burned to clear whiteness, may do good by supplying potash, an element demanded by the pear among trees, even as it is by the potato among vegetables.—P.M.O.

Ant Heap Soils.

"Novice" writing from Kokstad says:—The other day while at a neighbour's, I was among his potatoes, which owing to the recent dry weather are not much of a crop anywhere up here, but at a certain spot in his land (which is newly broken up) where there had been an ant heap, the plants stood fully 2 feet 6 inches high whereas the rest were well under a foot. What I should like to know is whether it is the fertilising properties of the ant heap that caused this luxuriant foliage or whether spots where antheaps have been, hold the moisture better, as if it is the fertilising properties it would be very easy to cart wagon loads of antheap on to the land and there have it broken up.

The explanation of crops doing better on antheap soils is that the spot in question contains more fertilising material and holds moisture better on account of the presence and activity of the ants for many years. The soil there has been thoroughly cultivated and much matter brought to the antheap, and eaten and digested there. Such soil would possess better mechanical properties, be actually richer, more moist and more fertile than adjacent land. Carting on antheap earth might have some beneficial effect though not to the same extent as where the natural heap had existed for years. Kraal manure and Guano would have a similar tendency.—E.A.N.

EXTRA TROPICAL FORESTRY.

THE TIMBER PLANTATION, FROM SEED TO SAW-DUST.

By D. E. HUTCHINS, F.R. Met. Soc., Conservator of Forests, Cape Town.

(*Continued from page 340*).

FOREST METEOROLOGY AND THE SELECTION OF TREES TO PLANT.

Forest Meteorology in Northern Europe is without the practical importance that it possesses in the extra-tropical parts of the world, and its study has been neglected in Europe, with the result that after the failure of many unsuitable trees, all introduced trees have been decried. Probably the number of trees that can be successfully naturalised in Europe is not very large. Forests anywhere else on the globe, growing naturally in a climate quite like that of northern and mid Europe, are small and unimportant. The only part of the world that might quite repeat the climate of northern Europe would be British Columbia, but that is quite altered by its very mountainous character. Many trees of North America have been planted in Europe, and *vice versa*. At one time it was believed fortunes were to be made by planting Robinia in Europe. Michaux strongly advocated the planting of the Southern Pitch-pines in Europe, but his confident anticipations of success were not justified. The climates do not correspond. In the extreme south of Europe, where alone it is warm enough for the Southern Pitch-pine, it is too dry in summer.

And here is the other side of the picture:

> "Professor Sargent, Director of the Arnold Arboretum, of Harvard College, estimates that five foreign trees are planted in New England to one native Yet of all foreign trees introduced into America, the willow alone, he thinks, has qualities not possessed in a greater degree by some native tree The European oak is, perhaps, the most unsatisfactory deciduous tree that has been experimented upon. It grows rapidly when young, but fails when about 20 years old, from the cracking of the main stem, and then, after dragging out a wretched existence a few years longer, it miserably perishes The Scotch pine dies long before reaching maturity, and the Austrian and the Corsican pine seem to be no better The Norway spruce, which has been for many years the most widely cultivated foreign tree in Massachusetts, becomes decrepit and unsightly just at that period of life when trees should become really handsome in full development.—(*Nature.*)"

Southern Europe, however, has a considerable area of forest in every quarter of the globe to select from, and it is the same with extra-tropical regions generally. Though Forest Meterology may be neglected in Europe as a study of little practical importance, ignorance of it when the European trained forester goes abroad becomes a serious matter.

For twenty years or more experiments have been made in India on the planting of Carob. Between 1875 and 1885 the pages of the *Indian Forester* contained frequent references to the experiments made, and gave long accounts of the growth of this tree in the Mediterranean. But here, as with so much of the experiments with introduced trees in India, the climatic factor was not sufficiently studied. In none of the notes and correspondence on the subject in the *Indian Forester* is it mentioned that the Carob in the Mediterranean is a purely winter rain-fall tree, and that it was sought to introduce it in Northern India, where the rain-fall is almost entirely in the summer. Some years ago the Bombay Government instituted experiments for the introduction of the Pitch-pines from the Gulf States of the United States of America to the plains of India. This was a more impossible proceeding than the cultivation of Carob on the plains of India. But most money was spent and most effort wasted in the attempt to grow the Eucalypts of temperate Australia in tropical India and in unsuitable climates on the Himalayas. Many of the unsuitable Eucalypts planted at Changa Manga were destroyed by White-ants. (*Indian Forester*, 1881.)

Two years ago the absence of meterological instruction at the Cooper's Hill Forest School, where Indian forest officers are trained, was called attention to by the Cape Government in a communication addressed to the School authorities. It is certain that the subject of meteorology is not nearly in its proper place in the school curriculum at Cooper's Hill. It receives more attention at the Yale Forest School.

This is not the place to do more than glance at Forest Meteorology, but this we may say briefly, that, provided temperatures are suitable, the governing factor in forest growth, at any rate, as regards the tropics and extra-tropics is the rain-fall. Soil is a subordinate factor, and its chief duty is to act as a store-house of moisture. If we look round the warmer regions of the world we see that the power of the forest and the vigour and size of its trees depends directly on the rainfall. The giant trees of the world, the colossal Sequoias of California a d the tall Eucalypts of Australia, are each in the wettest parts of their native countries. The finest forests all through the tropical world are in the wettest parts, and in the extra-tropics there are the noble forests of the Himalayas, of Japan and of the Gulf States of North America, all in well-watered regions, while all along the mountains forming the western backbone of the American Continent the forest varies as the climate. There is no denser or more vigorous forest than in Chili or Oregon, and these are the wettest spots in the extra-tropical world, simply dripping climate! Veitch, speaking of the subordinate factor of soil, cites "*Pinus densiflora* in Japan, growing upon slopes of almost bare rock, and *Abies bracteata* on the slaty debris of the Santa Lucia, where it would seem impossible for any vegetation to exist." Much the same thing is now seen on the stormy wind-swept slopes of Table Mountain above Woodstock. Here often on nothing more than broken rock are flourishing plantations of *Pinus canariensis, Pinus pinaster, Pinus halpensis* and Jarrah. In one locality, where 13 years ago the rock had to blasted to get the road through, trees now meet overhead. There is a good rainfall here, but little soil beyond what the trees have already made. In such a locality it is the rain-gauge that indicates the possibilities of successful tree growth.

TEMPERATURE

Temperatures also govern the species to be employed. The southern coast of Cape Colony is on the isotherm of the Mediterranean, of Southern California and of temperate Australia. It is the trees of those countries that naturalize on the southern coast of Cape Colony.

> Apart from obvious mechanical barriers, such as oceans, temperature is the most important single factor in fixing the limits beyond which particular species of animals and plants cannot go. Investigations conducted by the Biological Survey have shown that the northward distribution of terrestrial animals and plants is governed by the sum of the positive temperatures for the entire season of growth and reproduction, and that the southward distribution is governed by the mean temperature of a brief period during the hottest part of the year.—("Life Zones and Crop Zones," Hart Merriam.)

FIT THE TREE TO THE CLIMATE.

The chief cause of the inferior results obtained till lately in much of the tree planting done in South Africa has been a bad selection of trees.

It is too commonly assumed that because a tree will grow in one part of South Africa it will grow in another, under totally different climatic conditions. It is thought that because a tree grows in Europe it should succeed here, or worse still, because it grows in the tropics. I could mention cases where tree-planters in South Africa have lost thousands of pounds in planting trees in unsuitable climates. In South African Forestry, climate is of far more importance than soil. Of the sciences, Meteorology is probably the most important to tree-planters in South Africa, more important even than Chemistry or than Botany which is popularly placed first. Space forbids my enlarging on the subject here. But this I would say. Before you begin tree-planting, make a careful study of your climate and obtain the best advice on climatic Forestry. Do not plant the Blue-gum, a native of a wet country, in a dry climate, where it will either grow badly or suck up the water from springs, water-courses, or your garden. Do not take Eucalypts from the Eastern summer rainfall of Australia, and plant them in the Western winter rainfall of Cape Colony. Nor *vice versa*, the Western Jarrah and Kari in the Eastern summer rainfall districts of Cape Colony.

Do not plant near the coast, mountain trees such as the Deodar or Wellingtonia. Every tree has its own habitat, its own peculiar air and temperature, and it is little use attempting to plant it out of its habitat. Many trees grow fairly well as specimens in a garden but fail in the forest. Many trees will succeed for five, ten or twenty years and then fail. Of such are the Grevillea and many of the Eastern Eucalypts in the Cape Peninsula. Others will prosper till a bad season arrives—such as the dry summers of 1897 and 1902 after wet winters in the Cape Peninsula, which killed off a heavy percentage of *Cupressus macrocarpa* trees; or the drought of 1900 in the eastern districts which had more disastrous effects.

> Last year the avenue of *E. diversicolor* and *Tristania conferta* along the lower end of A. 17, 18, 19, was destroyed by frost, and the trees were coppiced in the hope that a less severe winter would allow them to start again well; this, however, did not happen, for they were killed down by a severe frost even worse than last year. and have now been removed and other plants substituted.—Fort Cunynhame, Cons. Rep, 1895.

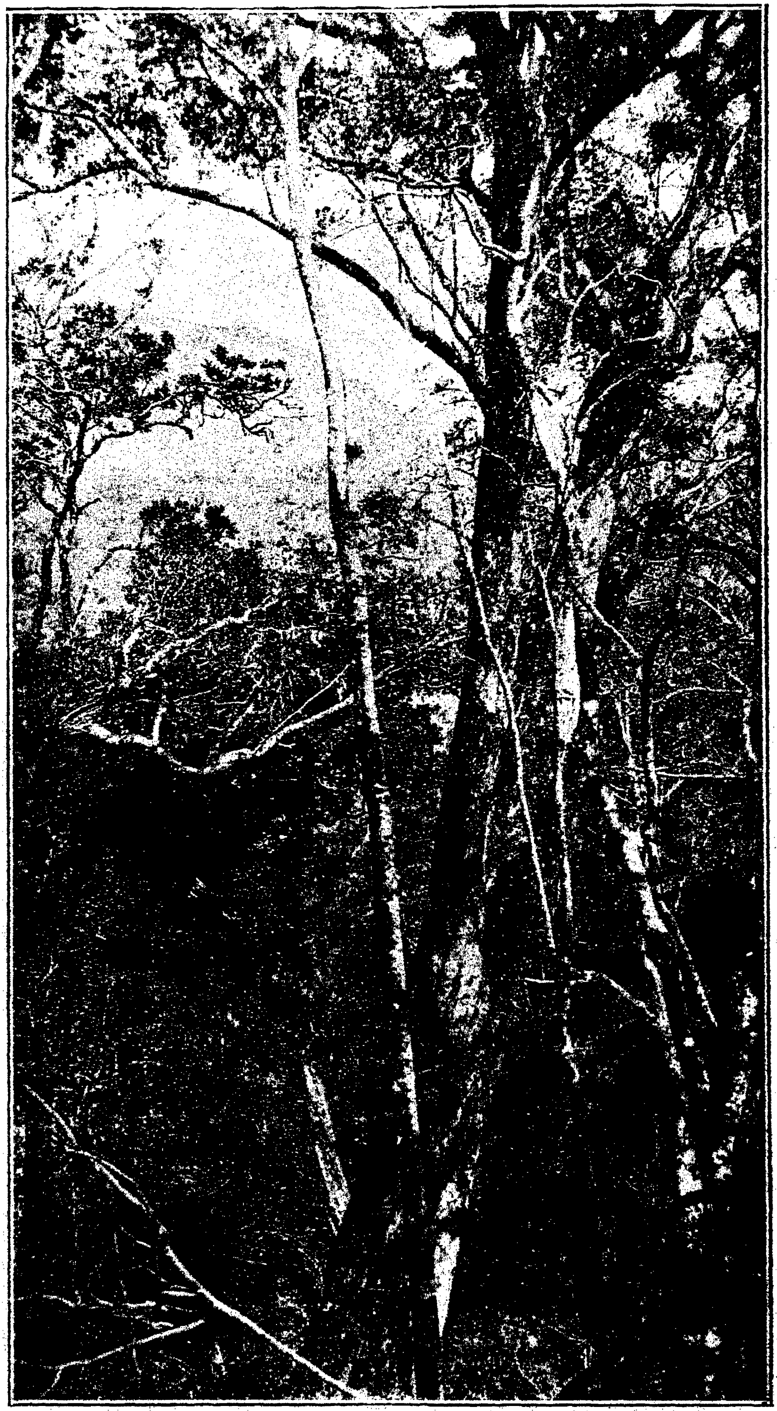
When, owing to an accident, water failed for some days in the Tokai nursery, it was the East Australian plants accustomed to a heavy summer rain that died. The dry-summer and dry-country plants took no harm.

The most disastrous failure with tree exotics that has occurred in the world's history is that of the Orange trees in Florida. The Orange is a tropical or semi-tropical tree. It has been acclimatised, more or less, in the mild climate of the Mediterranean. Southern Florida is semi-tropical, but for those cold snaps, characteristic of the climate of the whole of North America. It was natural to suppose that the Orange might succeed in Northern Florida. At first it did. Then came the historical cold snap of 1895 and a national disaster!

Before 1895 the yearly export was about five million crates. After the "freeze" of that year it fell to one hundred thousand crates. Oranges are still grown to some extent in Southern Florida, but the great plantations in Northern Florida are exterminated. (*Imp. Inst. Journal.* for Sept., 1902).

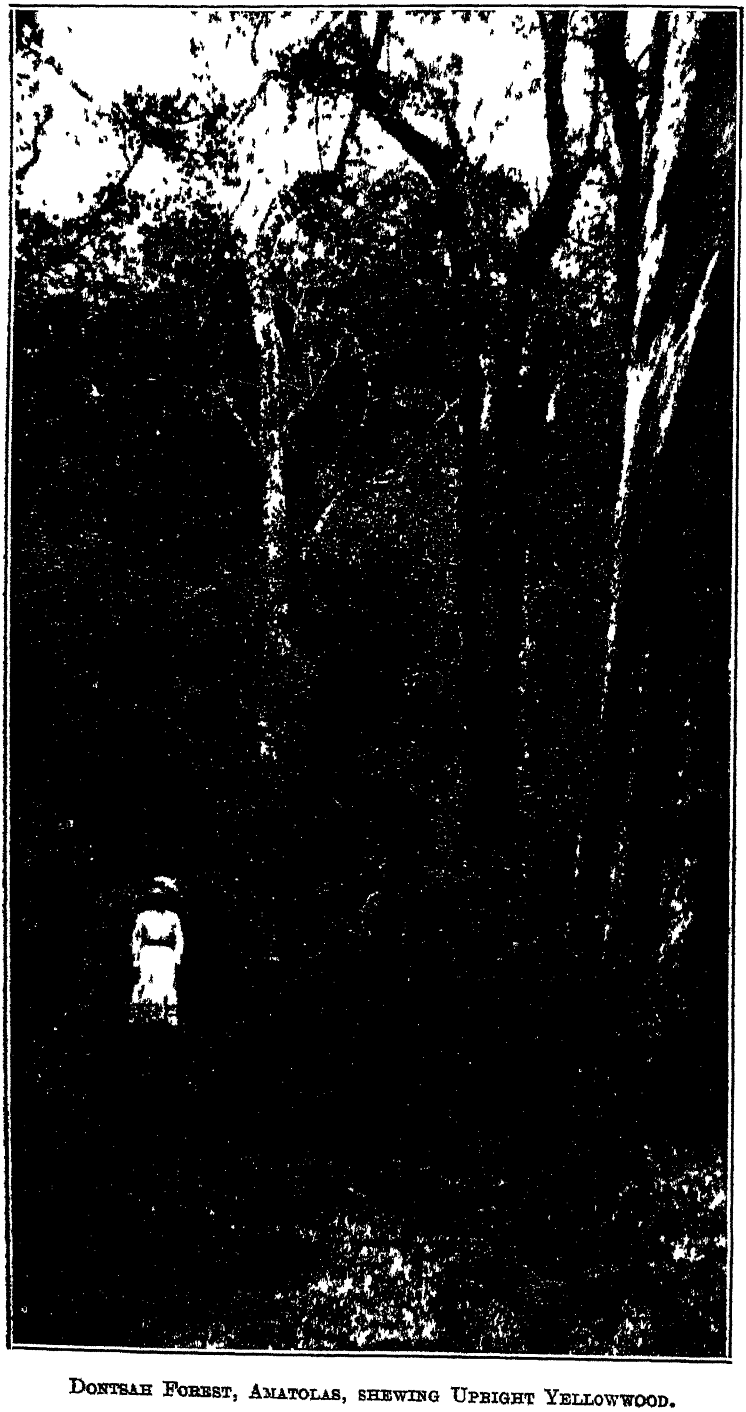
Climatic adaptability comes out at every point in dealing with forest trees. It is the experience of nursery work at Ceres Road that Cluster pine damps off less than Aleppo pine. According to T. Bowker (an experienced nurseryman,) of all the common Pines cultivated there, Aleppo pine damps off the most, and Cluster pine the least. Now, Cluster pine is a native of comparatively wet Western climates, while Aleppo pine is a native of the dry country of the east of the Mediterranean region. This difference of climatic habitat accounts for their different behaviour in a South African nursery.

To take another instance. The following extract is from the Government Blue-book on aided Parks and Botanic Gardens for 1900. If the Curator of the Graaff-Reinet Botanic Gardens wishes to grow Norfolk Island Pines otherwise than as an exotic he will have to extend his carting operations to the climate!



SNEEZEWOOD TREE IN THE PERIE FOREST

(*From photo. by O. Henkel*).



Dontsah Forest, Amatolas, shewing Upright Yellowwood.

(*From photo. by O. Henkel.*)

GRAAF-REINET BOTANIC GARDENS

At the committee meeting held in September, it was decided to remove the *Araucaria excelsa* from the centre walk, it being half dead and very unsightly. This has been done and the old soil removed to a considerable depth. Although I failed to find anything in the soil adverse to the growth of the tree, new soil was brought from another part of the garden and a young Araucaria planted, which I hope will do well.

Says Dr. Schlich in his Cirencester address (1903) :—

> "I desire to impress upon you this fundamental rule". "Never attempt to plant a species which is not thoroughly suited to the locality, that is to say, soil and climate. Every disregard of this rule is likely to lead to financial loss. It is quite astonishing how often this rule is sinned against. Sometimes the planter has not a sufficient understanding of what is the species most likely to thrive best in a given case. In other cases the planter has developed a fancy for a certain species and he proceeds to plant it under all circumstances. This is a most disastrous failing, which the Forester must combat with all his might."

In Forestry more skill and caution are required than in Agriculture. The farmer finds out his mistake when he harvests his crop, usually within a year. A Forester's mistakes may run on for a life-time before they are noticeable, except to the professional man. Mr. Newberry planted Macrocarpa Cypress on his fine estate near Clocolan in Orangia. For a quarter of a century every visitor spoke of the fine growth of trees in this Cyprus avenue. In 1904 I examined the trees in company with the Conservators of the Transvaal and Orangia. We soon saw that these trees were doomed. Most trees, unless they are altogether unsuited to the climate and soil, do well for a few years, perhaps for the first 20 or 30 years. An instance of this is the planting of *Eucalyptus robusta* in the Western and dry districts of South Africa. It is naturally a robust tree and under cultivation, especially with irrigation, it prospered well for some years. Then came the inevitable failure. As a native of the damp semi-tropics of East Australia it was quite out of its place in the South European climate of the Cape Peninsula or the dry Karoo.

The same thing happens every day with other trees. They are planted in soils, and more especially in climates, that are utterly unsuited to them. The planter may think that all is right. It may not be till his son's time that the error is discovered. Hence the great importance of caution and scientific training on the part of the Forester. The Farmer, the Engineer, the Architect, soon discover their mistakes. Crops fail, bridges fall, houses crack. Not so with the Forester. His knowledge of climates, soil and trees must be applied with foresight. Climate is his most important study in a country situated as is South Africa, since it is climate that has most to do with the growth and distribution of trees.

Want of caution and scientific training were only too evident in the early days of tree-planting at Johannesburg. We were told that every Colonial tree would grow there and grow better than in Cape Colony. On the deep soils and with the summer rains and forcing climate of the Rand this appeared to be the case *at first*. Then came the sequel—trees failing for no assignable reasons, while, in bad years drought and frost showed very plainly what were really practical forest species and what but tender exotics. Mr. Lippert the greatest of the early tree planters in the Transvaal told me that frost in the first part of the winter of 1895 wrought fearful havoc in the timber planations at Johannesburg. Blue-gum, Rostrata-gum, Pycnantha Wattle, Saligna Wattle, and generally all the broad-leaved evergreen trees were killed. There had been warm weather during the previous days that had made all the trees shoot. Black-Wattle, the Pines, and small leaved Gums, such as the tall *Eucalyptus amygdalina,* were almost the only trees that escaped.

These are, but instances of an oft-told tale. Nearly every enthusiastic tree-planter in South Africa has paid dearly for his experience. He proceeds too often on the assumption that every tree will grow anywhere, if only he can provide soil and water. In many cases a little knowledge or advice as to the specific requirements of his trees would have saved him thousands of pounds. Here is the converse to this. · Seven years ago I introduced *Eucalyptus corynocalyx* to the Robertson District. Now it is admittedly the best Eucalypt there. Whoever has planted it there has succeeded beyond expectation. But again, in the Eastern districts of Cape Colonly, it has been planted "not wisely, but too well." It is a tree of a scanty winter rainfall, and if put into a really more fertile climate with a general summer rainfall it languishes and dies young. *E. ficifola,* the common crimson gum of the West, is in similar case. They planted it at Grahamstown: it would not flower!

Temperate South Africa is cut off by the tropics from the forest trees of the northern hemisphere, by the ocean from the forest trees of Australia. Its own fertile forest area is so small that its flora is in the position of an island flora. And like most of the small island floras there is an inherent weakness in its members, rendering them difficult to propagate artificially, and making them also easily ousted by the stronger species of larger floras, as the Cluster-pine has ousted so conspicuously the native pine *P. canariensis* in Madeira, and as other strong invasive species have ousted the weak native species in Mauritius, St. Helena and other islands.

Hence it is the Forester's peculiar task in South Africa, while conserving and improving the indigenous forest, to select the best foreign trees for planting, and to fit them to the various South African climates he has to deal with.

Says Professor Gifford:—Œcology or the adaptation of a tree to its surrounding is the foundation of sylviculture. To do this properly two things are necessary: (1) A study of the climatic and other conditions prevailing in the trees' natural habitat, (2) a similar study of the climate and other conditions prevailing in the country to which it proposed to introduce the trees.

The word *habitat* is here used not to express situation, but in the broad sense of the country or area in which a species grows naturally.

EXOTIC SPECIES.

A species brought from a foreign climate and planted in an unsuitable one at home will always remain an exotic; tender, and liable to fail unexpectedly. A tree introduced from a foreign climate to a suitable one at home, becomes naturalised and can not be regarded as an exotic. It is very doubtful if such a thing as real acclimatization exists in the case of forest trees. "*Acclimatation, douce chimère des jardiniers*" said Du Petit Thouars.

The difficulty with introduced trees consists in so fitting them to their new climate that their naturalisation is complete. Otherwise they may live and flourish for a few years or more and then die unexpectedly and disappointingly. This often happens with the hardy Blue-gum in hot localities in South Africa. Countries that have been cut off from the rest of the world for ages naturally offer the best chances of successful naturalisation. There are notable instances of this in New Zealand, Australia, and Mauritius: and also in South Africa and Chili, where there are temperate regions cut off by the tropics from the rest of the temperate world.

On the other hand there is little use attempting the enlargement of a tree's natural habitat. Nature's laws operating through the ages have fixed the trees' natural limits, and though the agriculturist and fruit-grower can by cultivation largely extend the natural habit of artificial varieties, the Forester who has to leave his trees to nature, cannot do so. Thus in the west of South Africa we have numerous instances of successful introductions of trees from the Northern Hemisphere, but it is quite useless to expect that trees such as Sneezewood from the eastern summer rainfall area will prosper for long in the western winter rainfall area. It is true that the hedge plants Plumbago, and Kei apple, the Erythrina tree, and a few others are planted in the West, with more or less success, although they are Eastern species, but it is only by the aid of cultivation for a more or less extended period that this can be accomplished; and the practical Forester has little to concern himself with the cultivation of tender or half-hardy exotics. The history of Larch cultivation in Europe is a striking illustration of how difficult it is to extend a tree's natural habitat. Larch is indigenous on the European Alps at high elevations. It has been planted at low elevations in Europe with very varied success. A hundred years ago the monks of Kloster Ebrach introduced Spruce into their magnificent Beech forests, the finest I am acquainted with in Germany. The attempt to plant Larch failed: the elevation was too low. Similarly Larch succeeded well in Scotland for some years; then came the Larch disease which has wrought ruin in some of the finest Larch plantations in Scotland.

In the Forest Schools of Europe it was held for many years that the Forester had little or nothing to gain in the production of timber by going outside Europe. It was held that the European or Eurasian flora was so large and strong in itself that it could not efficiently or permanently be strengthened by the addition of trees from smaller and weaker floras or even from the large forest flora of

North America. Latterly, however, it has been recognised that many of the North American forest trees possess qualities which the European trees do not, that they can be thoroughly acclimatised in Europe, and that for beauty and timber production they should not be neglected. When I was last in Germany I found *Quercus rubra* quite successfully planted in the Black Forest, and the Weymouth Pine (*Pinus strobus*) constantly showing in the plantations I visited. The advocates of naturalisation further point out that the climate of Europe is known to have undergone secular variations and that climatic conditions now prevail which existed formerly. It is thus only natural to attempt to re-introduce species that have failed to return with the re-establishment of the old forest conditions, but which species are still to be found elsewhere on the globe. Thus in the Eucalypts of Australia we have a great class of timber trees which have disappeared entirely from Europe but which are now evidently well-suited to the present climate of Southern Europe. The Sequoias were once abundant in Europe; the two surviving species can now be restored from a relic that remains on the Californian Mountains. *Sequoia sempervirens*, the Redwood of California is one of the most valuable timber trees in the world, and in a suitable European climate, one of the most quick-growing.

Present opinion in Germany (1905) is that the following North American exotics grow well enough in Germany to be planted as forest timber trees:

Abietia douglasii, or Douglas Pine.
Picea sitchensis, or Sitka spruce.
Pinus strobus, Weymouth, or White pine.
Cupressus lawsoniana, or Lawson Cypress.
Quercus rubra, or Rubra Oak.
Robinia pseudacacia, or Common Robinia.
Careya alba, or Hickory.
Juglans nigra, or Black Walnut.
Together with the Japanese Larch, (*Larix leptolepis.*)

BACTERIA.

When the tree has been fitted as regards climate and soil, there may still be an unfitness in the matter of bacteria. There may be an absense of friendly bacteria, or an excess of unfriendly bacteria, which may eventually lead to the failure of the tree. Chestnut, Carob and Cork Oak in Cape Colony may be examples of this. Perhaps also Jarrah (*Eucalyptus marginata*). They can all be climatically fitted in South Africa: they may be planted in various soils; but they are not generally hardy and are liable after some years to suddenly and unaccountably die off. Further experimenting is no doubt desirable with these trees, but cautiously and with the knowledge of failure in the past.

SYMBIOSIS OR ROOT PARTNERSHIP.

This also may play a part (see below under "Forest Soils.") It sometimes happens that trees cannot, even in their own country, be propagated artificially. This is the case with many of the indigenous forest trees of South Africa, and it is possible that with them symbiosis may play the part it does with Sandal in India. Sandal is the most valuable important timber in the world. It grows like a weed in Mysore (Southern India), yet all the Sandal plantations made by various Foresters (myself included) failed markedly. The cause of this failure is now known to be symbiosis. In order to flourish, Sandal (*Santalum album*) must be able to connect its roots with certain other species. Limited experiments in the south-west of Cape Colony with the West Australian Sandal (*Santalum cygnorum*) shew that this tree is not easy to propagate in the forest nurseries and perhaps, it also, may require a root associate for successful propagation. Thus, Foresters working with a new tree in a new climate, should not put all their eggs into one basket. They must continue the trouble and expense of arboreta and test plantations, long after certain species have been obtained, which seem to fulfil every requirement; never however losing sight of the paramount importance attaching to climatic fitness.

THE USE OF LIME IN AGRICULTURE.

By J. Lewis, M.A., Government Analyst.

The problem of the amelioration of the soil is one that becomes of greater importance year by year. Land is expensive, good land and such as is well-watered, or lends itself to irrigation is scarce, and, as was cogently said some months ago, the farmers of this country are no longer protected by six thousand miles of ocean, but have to face the competition of the oversea producer, equipped with the appliances that science can give him. With this in mind, it will not be useless labour to consider briefly a subject of the greatest importance in agriculture, the part that lime plays in the soil. The subject is one that deserves far more attention than has hitherto been devoted to it, for, as the following pages will show, the proper use of lime will go far to increase the productiveness of many good soils, and to render soils workable which at present are too poor to repay cultivation. As will appear subsequently, the soil of the Colony is poor in lime and wherever a bed of limestone, gypsum or marl may occur, it should be regarded as a potential source of wealth to the farmer in its vicinity.

Lime exists in various combinations in nature, chiefly as carbonate in marl, limestone marble, shell-lime, as sulphate in gypsum, as phosphate in bones, guano, and mineral phosphate. With the phosphate there is no need to deal here, its value as a fertiliser in the forms of bonemeal, superphosphate, guano, and basic slag being dependent mainly on the content of phosphoric oxide. Gypsum and limestone, with the products burnt lime (or quick lime) and slaked lime obtained from the latter are cheap and their use depends on the basic constituent, *the lime* contained in them.

The function of lime in agriculture may be considered in four aspects, the mechanical, chemical, bacterial, and manurial.

I.—The Mechanical Action of Lime in the Soil.

If lime be added to a stiff clay, the immediate result is the agglomeration of the fine particles to larger complexes. The uniformly fine-grained impervious clay is modified to a mass consisting of comparatively large, though in themselves still small, particles. The circulation of air through the soil is thereby facilitated, a freer passage afforded to plant roots and the percolation of rain promoted, with a consequent diminution of the evil of scouring or rainwash. The tendency of stiff clay to harden after rain in due to the extreme fineness of the particles. If such a clay is stirred up with water the muddy liquid so formed remains turbid for a long time, but if a little lime is added the tiny particles of clay coalesce into flakes which settle rapidly. If two funnels are packed, one with clay, the other with clay mixed with from a quarter to one per cent. of lime, and pure water poured on the top of the layers it will be observed that, while the water percolates through the untreated clay in a period of time measurable in days, the limed clay allows of the passage of the water in a few hours. If the treate ! and untreated clay be moulded into balls and dried, the former will become a hard unyielding mass, the latter will crumble to slight pressure. Precisely this occurs in a limed clay soil, the clay is flocculated, the percolation of water promoted and caking prevented. Caustic lime is more efficient in modifying clay soils than gypsum or carbonate of lime. Sandy soils, on the other hand, are rendered more compact by liming. Particularly in this case when much organic matter is present. The soluble portion of this organic matter is flocculated and then binds the particle of sand together and prevents the rapid draining off of rain. Owing to the pronounced action that caustic lime exerts in promoting the decay of vegetable matter, one of the milder forms of lime is preferable in dealing with a sandy soil.

II.—The Chemical Action of Lime.

The decay of vegetable matter in soils poor in lime results in acid or sour veld. Liming with carbonate or caustic lime is a remedy, the lime supplied in either form neutralising the acids produced in the decomposition of the organic matter. The presence of lime also increases the rate of decay, and hence renders the valuable food elements more rapidly available for re-absortion by growing plants. It is a common observation that leaves remain long on the surface of soils deficient in lime, such as the granitic and sandy soils of the Western Province, and disappear rapidly in limestone districts. "Brak" is due mainly to sulphate or carbonate of sodium in the soil, the latter compound being by far the more injurious of the two. The addition of gypsum (sulphate of lime) to a soil suffering from excess of sodium carbonate results in the formation of the less injurious sodium sulphate and carbonate of lime, sodium carbonate plus lime sulphate becomes sodium sulphate plus lime carbonate.

This application of gypsum is frequently practised with good results on the alkali lands of the United States.

If soils poor in lime are fertilised with superphosphate, a portion of the valuable soluble phosphoric acid of the fertiliser combines with the iron and alumina in the soil forming insoluble combinations, which are only slowly and with difficulty absorbed by plants. The presence of lime retards this reversion, as it is called, and large quantities of lime may prevent it altogether or even reconvert the insoluble phosphati to a soluble form, thus placing a greater proportion of food at the disposal of the plant.

The minerals in the soil, many of which contain potash, are gradually being broken down by chemical action in such a manner that soluble compounds are slowly formed, which afford nourishment to plants. Lime, particularly in the form of gypsum has a remarkable effect in facilitating this decomposition of minerals, in particular does it increase the amount of available potash in the soil.

Since lime hastens the decay of the organic matter in the soil, and renders the potash and phosphoric acid more rapidly available to the plant, it will be readily understood that a soil rich in lime, or to which lime is added, will be exhausted far sooner than one poor in lime but containing the same percentage of potential plant food. In other words, the larger crops that can be grown in the presence of lime exhaust the land more quickly than poor crops. This explains the old adage :

> " Lime and lime without manure
> Will make both land and farmer poor,"

and suggests the remedy. The heavier crops raised carry off the plant food in the soil, and its place must be supplied by the increased use of farm-yard manure and artificial fertilisers.

III.—THE RELATION OF LIME TO THE MINUTE ORGANISMS IN SOIL.

The decomposition of vegetable matter in the soil with the change of the nitrogen into ammonia and nitrates (the form in which nitrogen is absorbed by the plant), the absorption of nitrogen from the air by the root-nodules of leguminous plants, such as peas, beans, lucerne, are all brought about by microscopic organisms, which thrive most vigorously in the presence of lime. The lime-loving nature of lucerne is well known. Before the discovery of the Chili nitrate beds the supply of nitrates was drawn, mainly from so-called "saltpetre gardens," where nitrogenous organic matter, as urine, blood and animal refuse generally, was mixed with lime and potashes, and allowed to ferment, the tiny organisms seizing on the nitrogen and converting it into nitrate. This same process goes on in the soil, and everywhere more rapidly in the presence of lime. Here it may be mentioned that lime destroys certain pests, such as slugs and worms in the soil.

IV.—LIME AS A DIRECT MANURE.

The need of liming to supply the small quantity of lime that is built up into the framework of the plant is not usually existent. Almost all soils contain sufficient lime for this purpose. The following table gives the weight of lime removed from an acre by an average crop :—

Red Clover, 120 lbs.	Tobacco, 98 lbs.
Wheat, 10 lbs.	Potatoes, 25 lbs.
Barley, 15 lbs.	Beans, 22 lbs.
Mealies, 30 lbs.	Peas, 48 lbs.
Vine, 42 lbs.	Lucerne, 225 lbs.

NOTE :—·01 Per cent. of Lime is 350 lbs. per acre.

Most plants are benefitted by liming, *e.g.*, spinach, lettuce, beets, onions, cauliflower, cucumber, cabbage, turnip, pea, tobacco, lucerne, clover, barley, wheat, oats; a few seem indifferent, mealies, millet potatoes, carrots; watermelon, sorrel are injured.

The following average percentage of lime in the virgin soil of a number of districts in the Colony are calculated from analyses made in the Government Analytical Laboratory. When it is borne in mind that many authorities hold that liming should be practised when the amount of lime falls below one-half of one per cent., it will be seen how poor our soils are in this constituent.

The table gives the number of soils analysed in the division, the average maximum and minimum percentages of lime present, the number of soils rich (above ·5 per cent), fair (between ·5 and ·25 per cent.), and poor (below ·25 per cent.) in lime.

Division.	No. of soils.	Average per cent.	Maximum per cent.	Minimum per cent.	Above 5 per cent.	·5 to ·25 per cent.	Below ·25 per cent.
Cape	25	·20	·64	·046	1	5	19
Malmesbury ..	54	·10	·42	·015	4	4	46
Paarl	23	·021	·078	·004	—		23
Worcester ..	30	·073	1·38	·006	1	2	27
Robertson ..	27	·404	2·65	·008	8	4	15
Caledon ..	30	·053	·27	·018	—	1	29
Bredasdorp ..	21	·20	·40	·094	—	7	14
Swellendam ..	37	·358	2·73	·019	7	9	21
Ladismith .	16	·148	·449	·031	—	3	13
Riversdale ..	24	·129	·770	·007	1	—	23
Mossel Bay ..	17	·208	·540	·070	1	4	12
Oudtshoorn	19	·501	4·595	·036	5	—	14
George	16	·031	·088	·009	—	—	16
Knysna	13	·096	·528	·028	1	—	12
Uniondale	12	·039	·080	·015	—	—	12
Cathcart ..	28	·162	·443	·014	—	6	22
Queenstown, Butterworth, Willowmore and St. Marks	20	·110	·350	·016	—	2	18
Komgha ..	27	·123	·469	·012	-	4	23
	439				29	52	258

How and when Lime should be Applied.

Heavy applications of lime, up to five tons per acre every five or six years was the practice in Europe, but this is giving place to some extent to the more frequent application of smaller quantities. Gypsum and Carbonate of Lime (limestone, shell-lime, marl) can be safely applied at any time of the year, but the best time to put down caustic lime is after the crop is gathered. The reason for this will be apparent from a consideration of the chemical behaviour of caustic lime. When this is exposed to moist air it 'slakes' to a fine powder which is strongly alkaline and destructive to young and tender parts of plants. On long exposure to air the slaked lime absorbs carbonic acid gas therefrom, changing to the carbonate or mild lime, a neutral compound which has no corrosive action on plant tissue. Only after time has elapsed for this change to take place, should the seed be sown. The burnt lime should be placed at intervals in the field, and covered with moist earth or, if the soil is dry some water may be sprinkled on the pile. In a few days it will have slaked to a fine dry powder which should then be spread over the soil and ploughed or harrowed in.

The chief available sources of lime in this country are the naturally occurring deposits of gypsum, shell lime, limestone and marl. Gypsum may be ground and used without further treatment. Limestone and shell lime should preferably be burned and slaked in heaps on the land. For not only is the action on the soil constituents and the vermin in the soil enormously increased, but, as 44 per cent. of the carbonate is expelled in the burning process, the cost of transport is almost halved, and, as the lumps of burnt lime crumble to powder as above described, the cost of grinding is saved. It must however be borne in mind that caustic lime should not be used on sandy soils except when much organic matter is available or heavy application of farm-yard manure are made. In other cases limestone or marl is preferable for sandy soils. In general, lime is of little benefit to really poor soils, but finds its best application in soils rich in available or potential plant food, but of poor tilth and in such cases its judicious use will yield the best results.

EXPERIMENT STATIONS.

The Experience of Canada.

There is at the present time a widespread and growing feeling amongst those interested in the agricultural advancement of this Colony that a great future lies before the suggested experiment stations, repeated reference to which has been made in the pages of this journal.

The accompanying memorandum has been kindly furnished directly by Mr. George F. O'Halloran, the Deputy Minister of Agriculture for Canada, and shews what such institutions have done for that great agricultural country, how they are regarded, and what the initial outlay, without equipment or stock, amounts to. The account is full of valuable hints, and is of the greatest interest.

THE DOMINION EXPERIMENTAL FARMS.

"The Dominion Experimental Farms form one of the important branches of work carried on by the Department of Agriculture of Canada. These Farms were established under the provisions of an Act of Parliament passed in 1886 (49 Vic., Chap. 23), and were designed to be of practical assistance to Canadian farmers by conducting experiments and carrying on investigations along all the more important lines of work included in agriculture, horticulture, and aboriculture The Act authorised the establishment of a Central Experimental Farm and four Branch Experimental Farms. The Central Farm was to be located near the capital, Ottawa, to serve the purpose of the two large provinces of Ontario and Quebec. The Branch Farms were to be distributed as follows:—One for the Maritime Provinces jointly, one for Manitoba, one for the North-west Territories, and one for British Columbia.

"In choosing the sites of these several farms, the purpose in view was to have them so located that they would be fairly representative, both in regard to soil and climate, of the larger settled areas in the provinces or territories in which they were placed. The Central Experimental Farm, as prescribed, has been located near Ottawa, where a suitable site was found, consisting of 465 acres of land, immediately adjoining the city on its southern boundary. The branch farm for the three Maritime Provinces was placed at Nappan, in Nova Scotia, a central point, near the boundary of New Brunswick and fairly convenient to Prince Edward Island. This Farm consists of 310 acres. The branch Experimental Farm for Manitoba was established at Brandon, and embraces an area of about 690 acres; while that for the North-west Territories was located at Indian Head, in Eastern Assiniboia, and consists of 680 acres. The site chosen for the branch Experimental Farm for British Columbia was at Agassiz, in the coast climate of that Province, and the total area embraced in the Farm is 1,100 acres, about 325 of which are in the Fraser Valley and 775 acres on the sides and top of the adjacent mountain.

"Each of these farms has been provided with suitable buildings and the stock, implements and other material necessary for carrying on the various branches of the work. In arranging the experiments to be undertaken at each of these institutions, such lines are followed as are most likely to be beneficial to the larger number of settlers within the influence of each farm. Such experiments are among the first to claim the attention of the officers in charge. While these farms are always open to inspection by the general public, farmers are especially invited to visit them, and many excursions of agricultural societies and other organizations are arranged for each year, which bring a large number of those particularly interested in farm work within the immediate influence of the farms, and the visitors are thus able to judge for themselves as to the usefulness and helpful character of these institutions.

"The officers of the experimental farms include a Director, an Agriculturist, a Horticulturist, an Entomologist and Botanist, a Chemist, an Experimentalist and a Poultry Manager, all of whom reside on the Central Farm at Ottawa. On each of the Branch Farms there is a Superintendent, who is charged with the general management of the work and who has under him a farm foreman and a sufficient staff of working men. At the Branch Farm at Nappan, there is also a Horticulturist, who takes charge there of the experiments with fruit, vegetables, etc.

"The Director supervises the work of all the experimental farms, and makes personal inspection of the branch farms at least once a year. In order that he may be kept in touch with all the work going on throughout the year, he receives from each of the Superintendents of the Branch Farms a weekly report in which particulars are given regarding the work in progress. He also conducts the larger part of the correspondence, and is charged with the management of the funds provided for the maintenance of these institutions. The Director also takes personal charge of the large distribution made to farmers each year, of the best and most productive cereals, etc., for the improvement of seed. From thirty-five to forty thousand farmers are engaged in these co-operative experiments each year. The extensive experiments conducted in the cross-breeding of fruits, carried on with the special object of producing varieties sufficiently hardy to endure the climate in all the settled parts of the Canadian North-west, are also part of the Director's work. He also conducts the experiments which have been in progress at the Central Farm for many years with fertilizers, to gain information as to their best influence on farm crops, and has also planned the permanent planting of belts and groups of forest and ornamental trees and shrubs on all the experimental farms.

"The Agriculturist conducts the field experiments with agricultural crops, investigates the best methods of cultivation of the soil and rotation of crops. He also takes charge of the stock and carries on experiments in connection with the feeding of animals to ascertain the comparative economy of different crops in the production of beef, mutton and pork. The various operations carried on in connection with the dairy work are also under his management, including the testing of different kinds of feed to find out their relative values as milk producers. He also conducts those parts of the correspondence which relate to field crops, stock and dairy work.

"The Horticulturist has a large orchard under his management and carries on experiments connected with the growing of large and small fruits, the production and testing of new varieties specially suitable for Ontario and Quebec, and the propagation of such sorts as are specially desirable for distribution. He also conducts experiments with vegetables to find out those which are earliest, most productive, and of best quality, and carries on the correspondence relating to the division under his care. He is also Curator of the Arboretum and Botanic Garden, which now contains nearly three thousand species and varieties of trees and shrubs and about 1,200 different sorts of perennial plants. The Horticulturist also manages the permanent forest plantations on the Central Farm which cover about 21 acres, and prepares yearly records of the growth of the different sorts of timber trees.

"The Entomologist and Botanist conducts investigations in reference to injurious insects and noxious weeds, studies their life history, and tests the usefulness of the various methods suggested to destroy these pests. He is also constantly engaged in making additions to the large collections of insects and plants now contained in the farm cabinets, which are of great value for reference. He also determines, by long continued tests, the relative value for hay and pasture of many native and imported grasses and other fodder plants. He is also frequently called on to identify and determine the purity of agricultural and other seeds and conducts the correspondence in connection with entomological and botanical subjects.

"The Chemist takes charge of the investigations made in the chemical division, which covers a large field. The nutritious constituents in fodder plants are determined, and, by analyzing them at different stages in their growth, the periods when they can be cut with the greatest advantage are ascertained. Much work has also been done in this division in reference to the analysis of soils, the action of manures, and in determining their relative usefulness as fertilizers. Investigations are also made as to the enrichment of soils by the ploughing under of clover, also as to the relations of cover crops and surface tillage to the moisture content of soils. Analyses are also conducted of cereals, of feeding stuffs, sugar beets and other roots to throw light on their feeding value. Researches are also made by the Chemist along many other lines, covering all the more important branches of agriculture. He also conducts the correspondence relating to chemical subjects.

"The Experimentalist has charge of the plot experiments, which includes the testing of a large number of varieties of grain, fodder corn and roots, to ascertain their relative earliness, productiveness and quality. He also controls the work connected with the breeding of cereals, a division in which much work has been done at the Central Farm. He also makes permanent collections of the more promising varieties. The care of the trees, shrubs and flowers on the ornamental grounds is also included in his duties.

"The Poultry Manager conducts experiments with the different breeds of fowls to gain information as to their relative merits as egg layers and flesh formers. Different sorts of food are used with different groups of birds, to learn which are the most economical to use. Careful accounts are kept of the number of eggs laid by the different breeds during the year and tests carried on to ascertain the most successful treatment of fowls to induce early winter laying. Experiments are also conducted to learn what breeds of fowls put on flesh most rapidly and what kinds of food it is most economical to use for this purpose. The Poultry Manager also attends to the correspondence on poultry matters.

"The Superintendents of the several branch farms conduct experiments to find out the best methods of preparing the soil, the proper time for seeding, the depth in the soil at which different seed should be sown and the quantity of seed to be used per acre. Comparative tests are also made with a large number of varieties of cereals, roots, grasses, clovers and other fodder crops, to find out their relative earliness, productiveness and general value and to ascertain which can be most successfully grown in the widely different climates in which these farms are located. Experiments are also conducted from year to year to learn how the fertility of the soil may be best maintained. Different classes of stock are kept and feeding tests are carried on with such combinations of food as can be most conveniently obtained in the districts where the farms are placed. Trials are also made with different breeds of stock to gain information as to which are the most useful and valuable for the several purposes required. The information gained from the trials made at all the farms with different sorts of potatoes and other vegetable products, has been very useful, indicating the best sorts for home use and market. Male animals are kept at each farm, for the improvement of stock and many experiments are conducted with poultry.

"At the Branch Experimental Farm at Nappan, Nova Scotia, experiments in milk production and in the fattening of steers and swine occupy a prominent place; also the growing of coarse grain, fodder crops and roots for these experiments. Orchards of considerable size have been planted here to test the many sorts of fruit which are grown in the Maritime Provinces.

"At the branch farms at Brandon, Man., and Indian Head N.W.T., where the raising of cereals is so important, a large proportion of the cultivated area on each farm is devoted to their growth. Many different varieties are tested to gain information as to their relative earliness in ripening, productiveness and quality. Fields are also sown every season prepared in different ways to demonstrate the best methods for securing large crops. Experiments are also carried on with peas, field roots, Indian corn (mealies), potatoes, grasses, clovers, flax and other useful plants.

"At both these farms experiments are conducted in the fattening of steers and swine.

"Many varieties of small fruits are successfully grown and their relative merits tested; but very little success has attended the efforts made to grow the larger apples. Recently orchards have been established stocked with new cross-bred apples produced at Ottawa by combining desirable strains of the hardiest stocks, and the experience thus far gained warrants the belief that these varieties will prove hardy in the North-west country, and furnish fruit in abundance of such size and quality as will be very useful for domestic purposes.

"To promote tree culture and the adornment of home, large quantities of trees and shrubs are grown every year at these Western farms and distributed to applicants free, through the mail. Considerable quantities of tree seeds are also similarly sent out.

"At the branch experimental farm for British Columbia, at Agassiz, the growing of fruit is made a specialty and large trial orchards have been planted containing varieties brought from many countries. This work is proving most valuable to the fruit-growers of that Province, as it gives information as to the most productive and profitable sorts to grow, also as to those which are most resistant to diseases which affect fruits in that climate. The work at this farm also covers trials of many sorts of cereals, roots, fodder plants, and vegetables, grown in comparative plots side by side, to determine which are most profitable in that Province.

"All the officers of the several farms attend and take part in some of the more important meetings held in the different provinces, where opportunities are given of bringing under the notice of the farming community fuller particulars relating to their work.

"Under this comprehensive system, carefully worked, much experience has been gained from year to year and a vast store of useful facts accumulated. A portion of the results achieved has been given to the public in the sixteen annual reports and forty-three special bulletins on various agricultural topics which have been issued since the farms were established.

"The experimental farms, being the first organized institutions provided for the benefit of farmers and fruit-growers generally throughout the Dominion of Canada, have had a marked influence on the progress of all branches of agriculture and horticulture in this country. The practical suggestions arising from the experiments conducted have done much to advance the stock industry; while the early investigations made in connection with the manufacture of butter and cheese did much to prepare the way for the remarkable growth which has taken place in the exports of these products.

"Varieties of wheat, oats, barley, and other agricultural crops have been brought from many different parts of the world and grown side by side, to find out how far these newer introductions were desirable for general cultivation. Those found valuable have been grown in larger fields and the crops distributed in sample bags to applicants for seed, and thus the growth of the more esteemed and profitable sorts has been rapidly stimulated. Many new varieties of cereals and fruits have been originated at the farms by cross-breeding and the more useful sorts multiplied and disseminated.

"Within the past few years the work has been greatly extended, and it has been found necessary to provide additional assistance in the several divisions. Further clerical help has been furnished to overtake the ever-increasing correspondence, while the enlargement of the fields of investigation has required additions to the technical staff, so that the efficiency of the work might be maintained and provision made that the demands of the agricultural community for information be met with reasonable promptness.

In all lines of agricultural and horticultural work evidences of the usefulness of the Dominion experimental farms are found in the general advancement which has been made with their help, and the good work is still going on. Farmers and fruit-growers who find difficulties arising in connection with their avocation write to the officers of the farms for suggestions and advice, and the publications issued—which are sent only on application—are now received by more than 50,000 farmers, who find them useful and reliable sources of information on nearly all farm topics.

"I give you the following figures of the cost of the farms at the time of establishment:—

Central Experimental Farm, Ottawa.

Area	465 acres.		
Cost	£15,129	15	10
Approximate cost of buildings and fencing, inclusive of eight residences	£31,666	13	4

Branch Farm at Nappan, Nova Scotia.

Area	310 acres.		
Cost	£3,398	6	8
Buildings, approximate cost	£3,750	0	0

Branch Farm at Brandon, Manitoba.

Area	690 acres		
Cost	£1,895	16	8
Buildings, approximate cost	£4,375	0	0

Branch Farm at Indian Head, North-west Territories.

Area		680 acres.		
Cost		£1,600	0	0
Buildings, approximate cost	...	£4,791	13	4

Branch Farm at Agassiz, British Columbia.

Area		1,100 acres.		
Cost		£2,780	4	2
Buildings, approximate cost	.	£3,125	0	0

"In each case of the branch farms the "buildings," as in the case of the Central Farm, includes fencing, and besides, a residence for the Superintendent.

"In explanation of the very large acreage of the British Columbia branch farm, I may say that a portion of this was donated by the Government of that Province."

It should be noted that the above figures do not include implements, live-stock or cost of management.

OSTEO-POROSIS.

BY THE CHIEF VETERINARY SURGEON, D. HUTCHEON, M.R.C V.S.

My special attention was first directed to this disease at Port Elizabeth in 1885. But subsequent inquiry led me to believe that individual cases of Osteo-porosis had been observed in different parts of the Colony previous to that date. At Port Elizabeth it made its appearance amongst the race-horses in one particular stable; and it happened to be one of the best equipped and most skilfully managed in the place. By a curious coincidence, the first three cases occurred in a colt and two fillies which were the progeny of the same sire. This led me at first to think that there might be some family predisposition. But subsequently the disease appeared in other horses which were introduced into that stable. These came from different breeders, and had no family relationship. No such disease had ever been observed on the farms where these colts and fillies were bred, nor were there any known cases of the disease amongst the horses in any other stud in or around Port Elizabeth during the time that it existed in this stable. The majority of the cases occurred in animals in their third year, but some of the colts or fillies ran well at two and three years old, and developed the disease in their fourth year.

This stable was comparatively new, the food was of the best procurable, and the water was drawn from the pipes which supplied the town generally. The only apparent influences in operation were high feeding, and hard training. But these influences were in operation in other racing stables which were not so well appointed as this one, but yet they were entirely free from this bone disease at that time. No treatment appeared to exercise any permanent curative effect, if the horses were left in the same stable, but individual cases which were sent away to the country as soon as the nature of the disease was recognised, and were fed largely on green nourishing food recovered.

It is interesting to note that in the outbreak of this disease recorded by Professor Varnell, which occurred amongst the horses on a farm, "the gentleman who occupied this farm, had another farm, a short distance only from the one on which the disease existed. On that farm not a single case occurred, although the horses were bred from the same parents, and were fed with the same kind of food; which consisted of bran or pollard, and the ordinary fodder of the farm."

In a very interesting report of his personal experiences of Osteoporosis in Hilo, Island of Hawaii, H.I. by Harold B. Elliott, M.R.C.V.S.* he expresses "the opinion that the disease is not *dietetic* but *climatic*, and that it appears to be associated rather with moisture than with heat and cold, or alternations of temperature." And the local conditions appeared to justify him in arriving at that conclusion. He says: "The temperature of Hawaii at sea level rarely exceeds 85° or falls below 65° Fah. District O. of the island is remarkable for its humidity, having an annual rainfall of 150 inches. The other districts of the Island are dry and rarely favoured with rain. The boundaries of district O. correspond exactly with the climatic conditions. It is in the humid district of O. that the disease is remarkably prevalent." He has never seen nor heard of a case *originating* in the dry districts.

"Moreover, removal of affected animals to the latter divisions of the Island is followed by immediate improvement and ultimate recovery; a termination which *never* takes place otherwise. It has also to be noted that the rapid recovery which ensues upon removal from the Osteo-porosis district, is not accompanied by any essential difference in the nature of the food. Further, within the boundaries to which the disease is restricted animals will contract it under any circumstances of diet, from the best quality of oats, down to a diet of crushed lava rocks."

Mr. Elliott admits, however, that "even in district O., the disease presents a marked preference for certain stables, in which it has been endemic for some years . . . The two stables of one plantation close to the town of Hilo, have proved hot-beds of the disease. . . . The neighbouring plantation, on the other hand, is almost exempt; only a rare case occurring from time to time, although the class of animals used, the nature of their daily labour, and their treatment in and out of the stable, are identical in every respect. In the stable of a large transportation company, who employ two hundred head of stock, I have never seen a single case of this disease, in spite of the fact that their animals do every kind of work, and the feeding has been changed over and over again."

It is evident, therefore, that even in the humid atmosphere of district O. of Hawaii which appears so favourable, generally, to the development of Osteo-porosis, something more particular or special is required to originate the disease, than moisture. Take Johannesburg, in the Transvaal, as an example of this, the climatic conditions there cannot be considered humid. We heard nothing of Osteoporosis in that town and neighbourhood until it became the principal racing centre in South Africa; and race horses from all the other Colonies were sent there. The feeding and watering of these horses, and the stable equipment and management, were as good, if not better, than elsewhere in South Africa. But notwithstanding this fact, Osteo-porosis soon became more prevalent in and around Johannesburg than in any other centre in South Africa. Yet a large number of individual studs remain free from the disease even there. And if the affected animals are removed to certain districts of the Cape Colony as soon as they give the slightest indications of the disease, they usually begin to recover at once.

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* Journal of Comparative Pathology and Therapeutics. Vol. XII p. 300.

A serious outbreak of this disease occurred at the Military Camp at Wynberg, Cape Town, in 1898, amongst a troop of horses which came from the Argentine. The history of this was supplied to me by Captain Lane, the Veterinary Officer in charge and is briefly as follows:—These horses on arrival here had to undergo a complete change of diet; having been reared on grass and lucerne pasture, and fed on lucerne hay during the voyage. A large proportion of them suffered from *Equine Malaria*—"Biliary fever,"—which very few imported horses escape, if they are left in the Cape Peninsula during the summer and autumn months. Subsequently a large percentage of them suffered from accumulations of sand in the intestines, due to the lack of mangers. The first indication that there was something seriously wrong, was the large number of horses which became lame after engaging in a week or more of military manœuvres. Some were apparently lame from splinter, others from spavin, or ringbone, while a number became lame without exhibiting any definite lesion to account for it.

When I first saw these horses in company with my Senior Veterinary Assistant Mr. Borthwick, and Captain Lane, there were about sixty suffering from different forms of lameness of varying degrees of severity, while several were unable to rise without assistance, and two or three were unable to stand when lifted up. Our suspicion of the nature of the disease was at once aroused, and a careful examination very soon confirmed it. The swollen appearance of the nasal and sub-maxillary bones was plainly visible in a number of those affected, and the *post mortem* appearances of the bones of some of the fatal cases, which we subsequently examined, left no doubt of the nature of the disease in the pronounced cases. The worst cases were destroyed at once, and the others received a more generous diet with the addition of bone meal.

The following is an extract from Captain Lane's report:—

"Previously the diet of these horses had been:—

Mealies	7 lbs.
Colonial Oat Hay	10 lbs.
Salt	½ oz.
Bran	1 lb.

In the middle of January the ration was changed to:—

Oats	5 to 6 lbs.
Alfalfa Hay	8 lbs.
Green Forage	4 to 6 lbs.
Bran	2 lbs.
Salt	½ oz.
Bone Meal	1½ oz.

Freshly-burned limestone, unslaked, was put into the drinking water, in small quantities. Shelters were provided, shed stabling open on the leeward side, and more care was taken regarding the rugging and general management of the horses.

"The effect of this diet and treatment was soon very marked. In about two or three weeks *every animal,* however far this disease had advanced, was observed to make some improvement. With the exception of some dozen very bad cases—(out of about four hundred horses)—all the horses became workable. A few were cast, and sold later, and the remainder went up-country in October, 1899, for active service."

It is unfortunate that the further history of these horses cannot be traced—more especially of those that were cast and sold. Because, judging by the history of all the outbreaks which have occurred in civilian studs, which are fully known to us, we do not remember one single case of permanent recovery from Osteo-porosis which has taken place, after the disease has become so far advanced as to be clearly diagnosed, even under the most generous treatment as regards diet and care, *unless the animal is removed immediately* to a different locality and surroundings. The experience gained by Captain Lane of this disease at the Wynberg Camp is therefore exceptional, and one can easily understand that, when considered in conjunction with the conditions and circumstances under which the disease manifested itself amongst the troop of horses stationed there, he would naturally feel justified in arriving at the conclusion "that Osteo-porosis is in some way connected with the food, or with the mal-assimilation of the food; or to the absence of some essential ingredient of the food, or to its presence in such small quantities as to be insufficient for the necessities of the animal," &c, He then goes on to say:—"It is well known that in many parts of South Africa there is a great absence in the soil of phosphates and of lime. Crops grown on these lands would of course be deficient, to a great extent, in these properties."

"There have been some fifty well-marked cases of this disease at Wynberg amongst South American horses. Most of these horses suffered greatly during the past twelve months from sand colic, as there were no mangers. They have been exposed to a great deal of wet and cold weather, and there has been an enormous amount of 'Bilious fever.' These diseases have. I find, left many horses with their digestive systems greatly impaired, the liver being much affected." In reporting upon an outbreak of Osteo-porosis which appeared, principally amongst the mules and donkeys, at the Military Garrison at Middelburg, C.C., during 1904, Captain Lane has attributed the outbreak there to *mal-nutrition* and *exposure,* and considers that mealies and Colonial oat-hay do not contain the necessary nourishment, in proper proportion, for animals exposed to hardships such as these mules have endured. He is, therefore, of opinion that Osteo-malacia would be a more appropriate name for this disease than Osteo-porosis. I am afraid, however, that Captain Lane, like the majority of those who have written about Osteo-porosis, has traced the close relationship between these two diseases of the skeleton, more from his preconceived opinion respecting their supposed common origin, viz., a deficiency of phosphates in the food supplied, than from any close similarity which he has been able to discern in their course and pathology. But Osteo-porosis is perfectly distinct in its nature and origin from Osteo-malacia.

The latter disease affects all classes of stock in many districts of South Africa. It is, however, most commonly met with in ruminants, and amongst these, cattle are by far the most subject to this complaint. It is comparatively rare to meet with it amongst solipeds, and it is still more rare amongst solipeds that receive a grain ration of any kind either alone or in addition to the common food supplied by the pasture. Few men have laboured more than myself to convince the farmers of this Colony that Osteo-Malacia, locally known as "Lamziekte" and "Stijfziekte," is due to a deficiency of phosphate of calcium in the natural vegetation of the district where the disease prevails. Numerous test experiments, as well as wide experience and abundant opportunity for close observation have already established that fact. Further, it has been demonstrated with equal clearness, that if a liberal allowance of phosphate of calcium in the form of crushed bones, or bone meal, is artificially added to the natural food supply, it not only arrests the further development of the disease in the herd in which it is prevalent, but it is equally effective in restoring the decalcified bones of the affected animals to a sound and healthy condition without the necessity of removing them from their previous surrounding.

Osteo-porosis, on the other hand, appears to be confined to solipeds; those cases which have been reported as occurring amongst cattle and sheep are very doubtful. I am of opinion that they were cases of Osteo-malacia. Diet does not appear to have any influence either on the origin or development of Osteo-porosis. It is equally liable to occur in the most completely appointed stables; where the food, care, and management are of the best; as it is in the half-starved and hard-worked animals which are kept in the most insanitary of surroundings.

In this connection I would like to point out that previous to 1898, the date when Osteo-porosis appeared amongst the Argentine horses at the Military Camp at Wynberg, it was extremely rare to meet with a case of the disease either in Cape Town or its suburbs, but the increase in the number of cases since that date has been alarming. At the present time, it has become the greatest scourge affecting the horse stock of the Peninsula. Mr. Wm. Robertson, Bacteriologist to the department, who has had his attention specially directed to the investigation of this disease, states that he has had over 156 cases under his observation during 1904. And the majority of these were carriage and riding horses, and family pets. Now what is the cause of this rapid increase in the number of cases of this disease. It cannot be justly attributed to a falling off in the art of feeding and stable management; for, as already remarked, the large majority of the cases have occurred in studs that are well-fed, well cared for, and kept under the most approved sanitary conditions The Imperial military authorities attribute it to a deficiency of phosphates in the oathay which is grown in some of the Colonial districts, such as Malmesbury. But it cannot reasonably be maintained by any one possessing a knowledge of the subject that this deterioration of the grain lands of the Colony has taken place within the last six years, the date on which Osteo-porosis first assumed any importance in the Cape Peninsula. And if not, how are we to account for the fact that during all the years previous to that date; when Malmesbury and Koeberg oathay constituted almost the whole of the forage supplied to the horse stock of the Cape Peninsula and many other districts we never heard of a case of Osteo-porosis amongst them. It would be much more logical to argue that as this disease appeared just about the time that over-sea provender began to be imported, and continued to increase in proportion to the increase in the amount of such provender consumed, therefore the origin and rapid spread of Osteo-porosis in the Cape Peninsula is due to the incomplete feeding properties of imported fodder.

It is manifest, however, that something has been introduced into the Cape Peninsula during recent years, which did not exist before, or it existed in such minute quantity as to be unappreciable, but that something is certainly not Colonial grown forage.

It is evident to me, therefore, that the originating cause of Osteo-porosis is quite distinct from that of Osteo-malacia, and although they may both present certain resemblances more especially in the long bones of the limbs they are quite distinct in their pathological anatomy.

In Osteo-malacia we get a softening of the calcified portion of the bone, with slight enlargement of the medullary spaces, and these, especially in the long bones such as the femur and tibia, become filled with marrow of a highly vascular character, varying in colour from a dark red to a dull yellow. The cancellous tissue towards the extremities of the long bones is increased at the expense of the compact cortical layer: and its trabeculæ are filled with a semi-fluid oily looking material. A similar condition is often seen in the vertebræ, in what is locally known as "Lamziekte," or paralysis in cattle. The diseased action appears to proceed from within outwards But the affected bones are not changed in size, or in their external appearance in Osteo-malacia. The external compact tissue of the bones presents its natural character and appearance and is only slightly decreased in weight

In Osteo-porosis, the conditions are quite different. In that disease the affected bones are enlarged, their tissues soft and elastic, and, their honeycomb texture full of extravasated blood. Dr. G. Harley, in reporting upon the specimens submitted to him by Professor Varnell says:—"As regards the bones of the head, the disease, although it affected all the bones, was most advanced in the lower jaw. The bone was considerably hypertrophied in its transverse diameter: the periosteum readily detached; the osseous tissue was of a pink colour, and on pressure a quantity of blood oozed from its surface, as if from a sponge. The osseous tissue was elastic to the touch, and so soft that it could with facility be cut with a knife. The surface of the section had a somewhat fleshy appearance, but to the nail it conveyed rather the impression of cartilage. When examined microscopically the osseous tissue was seen to be expanded into a net work of fine fibres. The Haversian Canals, on the other hand, have become so enlarged that at first sight they might be mistaken for bony tissue, and the bony tissue mistaken for Haversian Canals. . . . The enlarged Haversian spaces are filled with a gelatinous matter, mingled with a small portion of fat, and here and there pervaded with fine, scarcely visible fibres."* In advanced cases we find that the sinuses of the face become filled with a firm gelatinous exudate, irregularly mixed with fibrous tissue, and spicules of bony matter. *Vide* plate.

In continuation of the description Professor Varnell says:—"the bones after being macerated and dried exhibit many peculiarities which are not apparent in their fresh state; for instance, the ulceration of the articular surfaces which seemed to be altogether confined to the cartilages of incrustation, was found on their removal to affect the bone beneath." He considered that the loss of the cartilage depended primarily upon the diseased condition of the bone. . . . Scarcely an articulation of the whole body was free from this worm-eaten condition of both bone and cartilage."

"It was found likewise, in cleaning the bones after maceration, that from their extreme softness, great care was necessary to prevent their different processes (epiphyses) from being detached, and the application of the slightest force to a portion of ligament or tendon, that was not sufficiently separated by decomposition, would be certain to effect their removal." I have quoted so largely from this report of Professor Varnell's because his description represents very clearly the characteristic appearances which the bones present in Osteo-porosis. And although that report was written forty-five years ago, we appear to know very little more respecting the etiology of this disease than was known then.

IS IT INFECTIOUS, CONTAGIOUS, OR INOCULABLE?

The whole of the evidence connected with the several outbreaks of Osteo-porosis, the history of which is known, points to some definite originating cause. Something which can either arise in, or be brought to a stable or locality, where it gave no indication of its presence before. And when once the disease has appeared, it will continue to manifest itself, with more or less frequency, in that stable or locality for an indefinite period, unless some radical measures are taken to arrest it. Numerous observers have noticed that "if a fresh horse is put in a stall which has just been vacated by one which suffered from Osteo-porosis, it usually contracts the disease within a limited period." "A merchant in Cape Town, working one pair of horses at a time, has lost, in succession, three pairs and one single buggy horse within two years. Another merchant lost six animals in four months" (Wm. Robertson). Mr. Elliott, in the article already referred to, says: "In one stable which has suffered severely from the ravages of this disease, the animals stand in two rows facing each other, and it has been remarked that the animals next—(there are no stall partitions)—or opposite to the diseased animals are often affected. Out of a batch of twelve unbroken native horses introduced into this stable three years ago, only one has escaped this affection. In another stable, Osteo-porosis prevailed several years ago, and slaughter of the affected animals was followed by a cessation of the disease." We have seen numerous examples of similar results following slaughter or removal of affected animals, and the thorough overhauling and disinfection of the stables, &c. "It is a common experience in Europe and America that a farm or district, which has been previously free from the disease, suddenly has an outbreak in enzootic form; and this will last for a year or two, then remit, only to appear with its old force after an interval of some years." *

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* *Vide* Principles and Practice of Veterinary Surgery by W. Williams, Tenth Edition, p. 189.

All these facts point strongly to the existence of some definite causal agent. It must be admitted, however, that Mr. Robertson, of this department, has failed to discover any special organism, either in the blood or diseased tissues of an affected animal. Continuous search has also been made by him for any special animal parasites in the digestive track, or in any other part of the body. Numerous attempts have also been made to communicate the disease by intravenous and sub-cutaneous injection of large doses of blood, freshly drawn from an affected animal; and horses both young and old have been fed for some time with the diseased bones and marrow from advanced cases, but hitherto without obtaining any positive results. It is quite possible, however, that the infective agent of Osteo-porosis, like that of several other animal diseases in South Africa, requires to pass through an intermediary host. Some further experiments are in progress with the object of trying to elucidate that point.

There is one serious difficulty in fully accepting the opinion that osteo-porosis is due to a specific infective organism, viz., the fact that the progress of the diseased action in the bones may be arrested by simply changing the surroundings of the patient. The large majority of infective diseases, when once started, run their regular course, even under different conditions and surroundings. It will be admitted, however, that certain local conditions, climatic and other, do exercise a modifying influence on the character and severity of the attack in most diseases, and favour or otherwise the chances of recovery. The influence of a change of the conditions and the surroundings on certain diseases is therefore simply a matter of

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* Veterinary medicine by Professor Law. "Ithaca." Pub. by the Author.

degree, some more, others less. It is not only possible, therefore, but very probable, that certain local conditions are necessary for the multiplication and development of the hypothetical infective organism of Osteo-porosis; and there are evidently certain conditions and surroundings in which it is unable to pass through its complete life cycle. More especially if a change of host is necessary.

SYMPTOMS.

In the early stages of Osteo-porosis the symptoms are very indefinite and often misleading, even to the Veterinary Surgeon, unless the disease is suspected. But there are many cases in which the Veterinary Surgeon is thoroughly convinced that the animal is developing osteo-porosis, but as there is no visible local lesion to account for the stiffness or lameness, it is difficult to explain the nature of the case to an owner who has had no previous experience of the disease. The symptoms simulate rheumatism so close, even to the shifting character of the lameness, and as treatment has to be adopted, that for rheumatism is tried, but with no satisfactory results, either to the patient, the owner, or the Veterinary attendant. The latter is usually hoping daily to see some characteristic local lesion which will decide the matter, and relieve him of the suspicion that he knows nothing about the nature of the. case. The symptoms vary. In some cases the animal goes tender and short in front, simulating navicular disease; others appear stiff in the back and manifest a difficulty in rising when down. Some of these cases develop rapidly, and it is nothing unusual to find the animal unable to rise even with assistance some morning; fracture of the dorsal or *lumbar vertebræ* having taken place during his struggles to rise. But I have known horses work for a considerable time after this stiffness in the hind-quarter appeared. One heavy draught horse, suddenly fractured his *lumbar vertebræ* while straining to start a load in a Scotch cart after being observed stiff for several months.

In some cases the symptoms point to certain joints—most frequently of the hind legs. But as treatment is adopted, the lameness may shift from one joint to another in the same, or sometimes in the opposite leg. Swellings of these joints often occur—and in individual cases, epecially in the fetlock joint, the exudation around the joint appears of a bony character.

In other cases there is acute pain and tenderness in the hind legs, the animal, being unable to bear the weight of the body without acute pain, is observed constantly to lift up one leg after the other, similar to the symptom of severe sprains of the back tendons. Such cases usually break down suddenly, the flexor tendons becoming torn away from their attachment to the os-pedis, the thin layer of compact tissue coming away with the tendon. In aggravated cases all four legs may be affected in this manner. But the lameness or stiffness exhibits all forms. It may occur in the hind quarters, which may be so stiff that the hind legs cannot be carried forward separately in a trot, the animal brings them forward together as in a canter but with a manifest stilted gait. In other cases one or both shoulders will be so stiff that the fore-legs can hardly be moved forward. Fracture of the bones of the limbs may occur without any manifest cause, and in advanced cases I have seen more than half of the ribs fractured, some of them twice in succession, and attempts at union by a large imperfectly formed callous. One of the characteristic symptoms, is what is known as the "abdominal line" in breathing, seen in acute pleurisy. This is evidently owing to the ribs being invariably affected.

ENLARGEMENT OF THE BONES OF THE FACE.

In a large number of cases, a slight enlargement of the nasal bones may be detected in the early stages of the disease; while in others, the animal may have exhibited the peculiar forms of lameness and stiffness for months before the characteristic swelling of the bones of the head appear. It is often remarked that when once the bones of the head begin to enlarge, the swelling increases rapidly, especially in the maxillary bones.

APPETITE.

The appetite is generally good; some refer to it as being voracious, and it is usually maintained for some time after the maxillary bones have become greatly enlarged. It is marvellous how little the process of mastication appears to be interfered with in some patients. In other cases, however, more especially in young animals, the maxillary bones become greatly swollen, highly vascular and tender, and when such is the case, the process of mastication is seriously interfered with, and the animal falls off rapidly in condition. Respiration also becomes seriously obstructed in some such cases, due principally to the large amount of that fibro-gelatinous exudate which fills up the maxillary sinuses, immediately bordering on the nasal passages, and narrowing their channel. The fact that the appetite and general health are not affected until the disease has so far advanced as to seriously interfere with the functions of vital organs; or the pain in the limbs, ribs, &c., is so distressing as to prevent the animal from resting or feeding properly, would appear to indicate that the disease is not primarily due to any derangement of the assimilative force of the system generally, but is caused by some special derangement of the assimilative power and secreting function of the bone cells alone.

POST-MORTEM.

It is the flat bones of the head, the ribs, and of the pelvis, which are usually most severely affected in Osteo-porosis. The next in order are the bones of the vertebræ, especially those of the dorsal and lumbar regions. Then follow the bones of the limbs; but this order is not uniform, as will be apparent from the great difference in the order of the symptoms. There is no constant lesion in any other organ or tissue of the body. Except when an affected animal is allowed to live on until it has become greatly emaciated, when the muscles and other tissues would be pale and flabby-looking.

THERAPEUTICS.

Our experience of Osteo-porosis with respect to the curative treatment has been similar to that of Mr. Elliott, and cannot be better expressed than in his words. He says: "I have treated this disease with many medicinal agents (calcium phosphate, potassium iodide, mercurus chloride, arsenic, strychnine, antiseptics. cathartics, counter-irritants, absorbents, tonics, hæmatinics, &c.), and have at times been flattered by deceptive appearances of recovery, but the end has invariably been the same. The recoveries resulting from change of locality contrast strongly with the inadequacy of drugs. Even if the animal be reduced to a skeleton, and almost unable to walk, he is still capable of ultimate utility if this measure be adopted. Two thoroughbred animals, each four years old, were in the last stages of this disease; they were removed to a dry district, well fed, and allowed the run of a small paddock. Restoration to normal health was effected in three months. But although the animal waxes fat and regains the full vigour of health and strength, the enlarged condition of the maxillæ is a permanent change." In my experience I have seen two cases where the swelling of the nasal and maxillary bones almost completely disappeared. These were thoroughbreds, which were affected at three years old; completely recovered on being removed to the Karoo, and were used as sires afterwards.

Description of Coloured Plates.

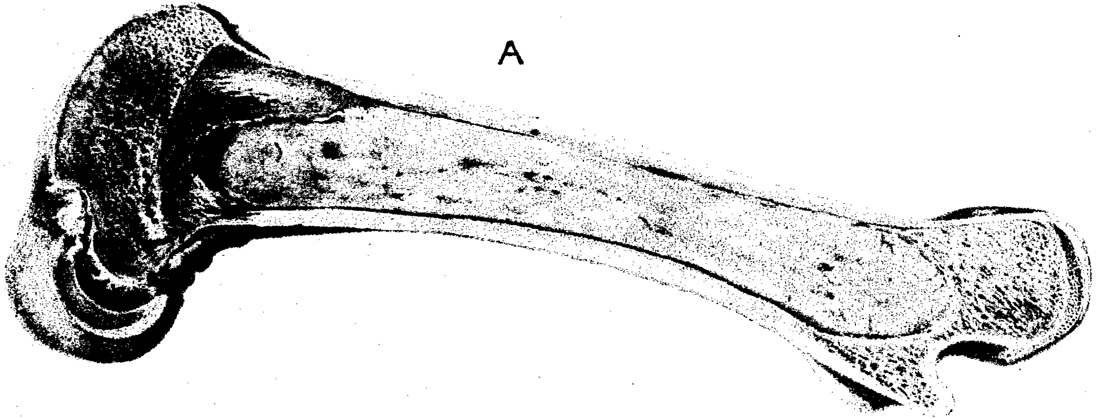
A. Section of Healthy Femur.

A¹. Section of Femur affected with Osteo-porosis.

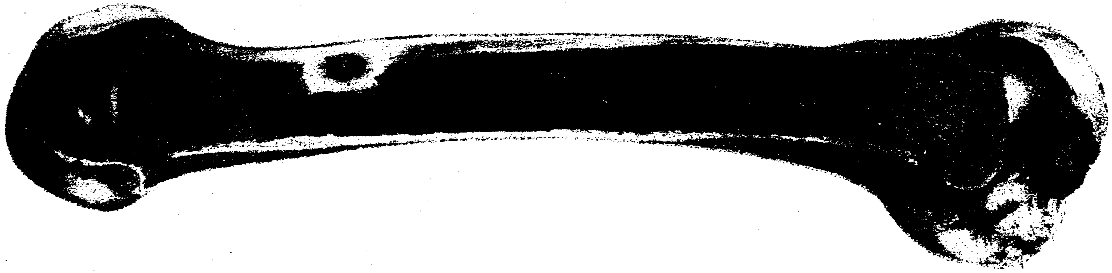
B. Section through the centre of the bones of the face, showing how the whole of the sinus become filled with a firm gelatinous exudate, irregularly mixed with fibrous tissue, and spicules of bony matter.

C. This is a transverse section of the superior maxillary sinus filled with the gelatinous exudate.

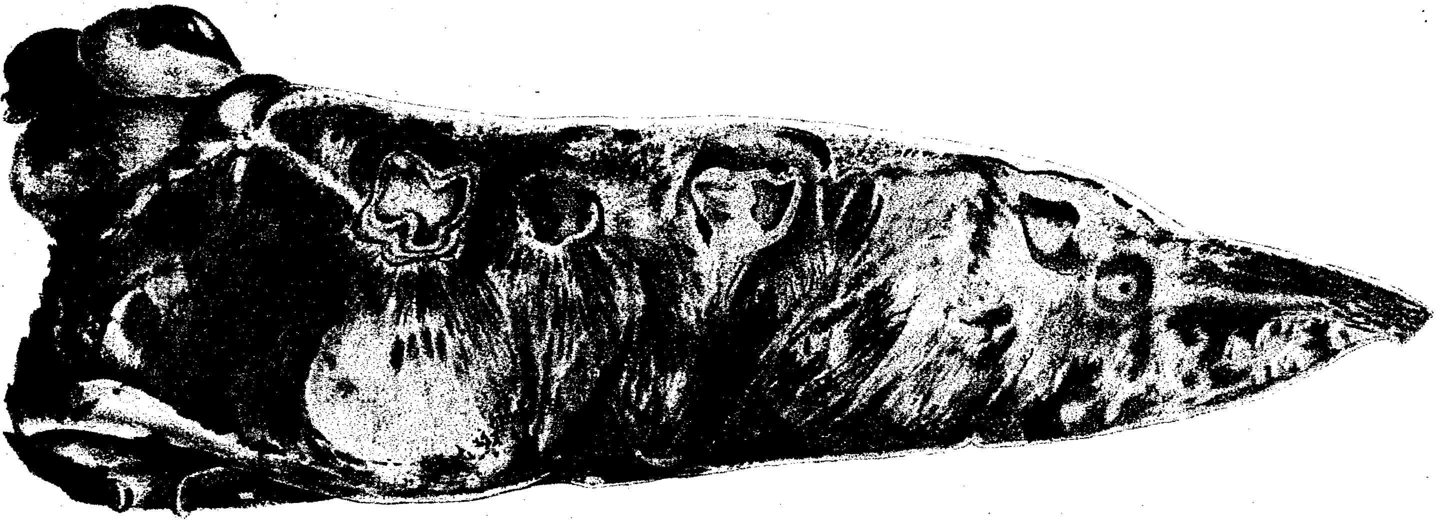
A



A'



B



F M^{c} Manus del.

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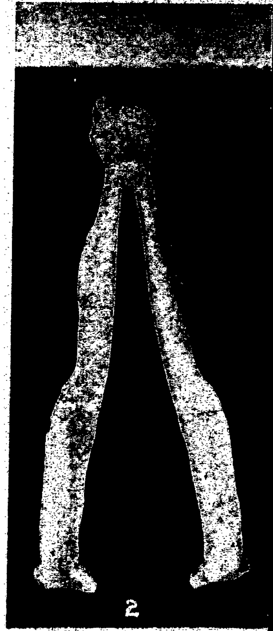
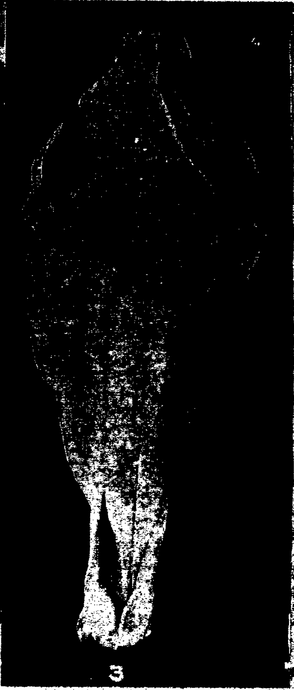
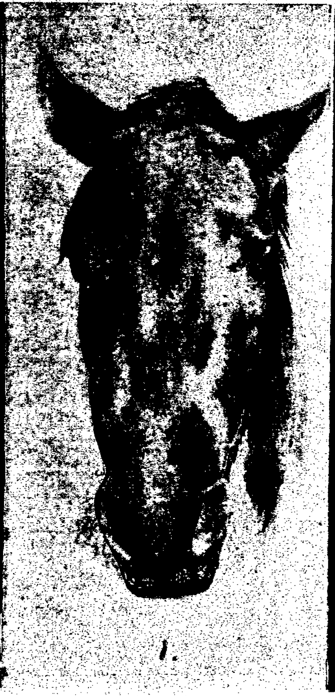


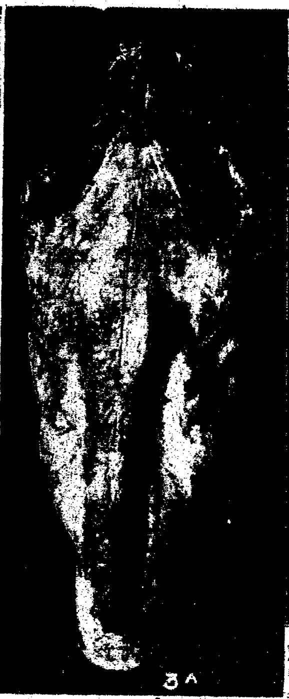
2. Lower Jaw from Healthy Horse.



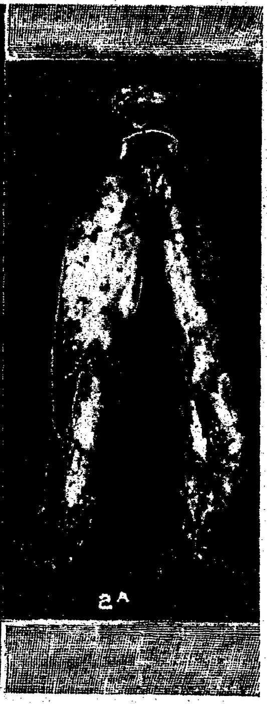
3. Head of Healthy Horse.



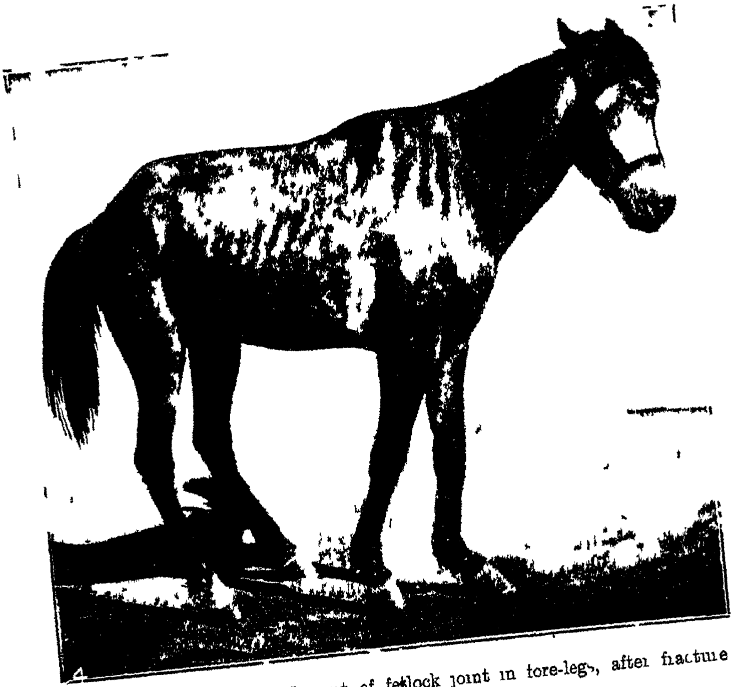
1. Case of Osteo porosis during life, shewing swelling of Head.



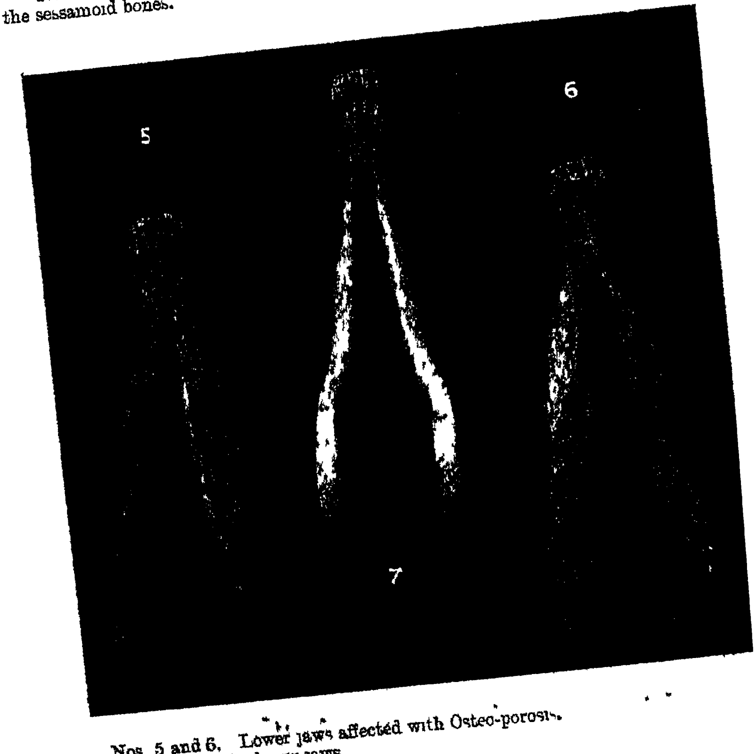
3A. Head case Osteoporosis.



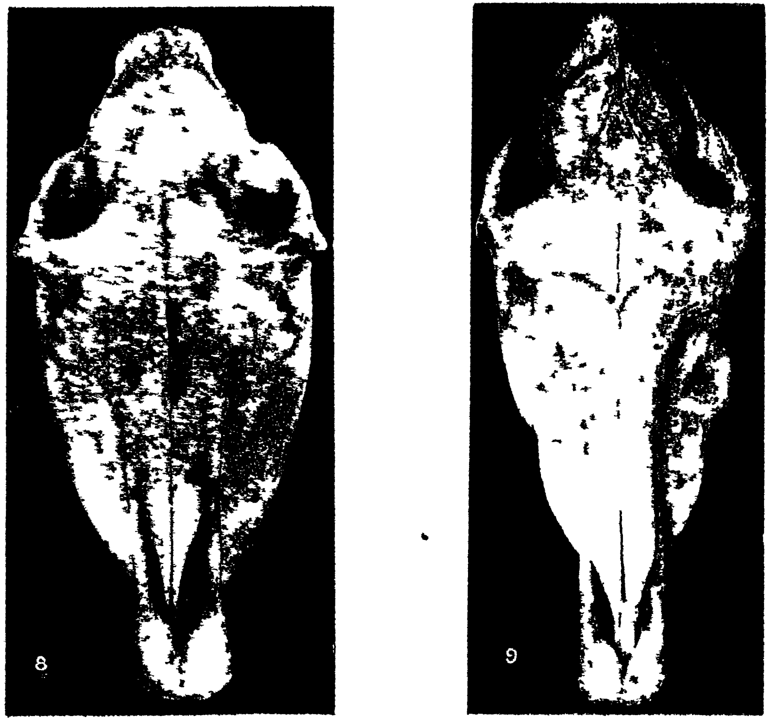
2A. Lower Jaw case Osteoporosis.



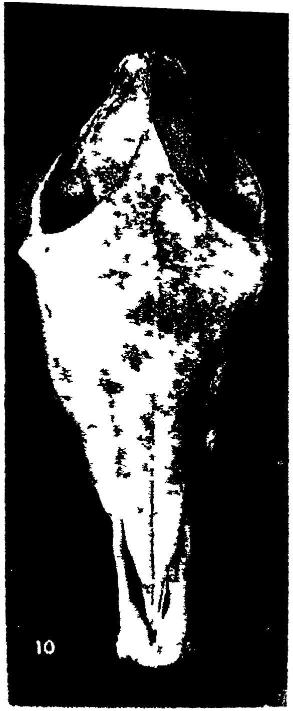
No. 4 Horse showing descent of fetlock joint in fore-legs, after fracture o the sessamoid bones.



Nos 5 and 6. Lower jaws affected with Osteo-porosis.
No. 7 Healthy lower jaws.



Nos 8 and 9 Heads affected with Osteo porosis



No 10 A Healthy Head

WESTERN PROVINCE AGRICULTURAL SOCIETY.

THE 1905 SHOW.

The annual fixture of this Society, held on the picturesque grounds at Rosebank, on the 22nd, 23rd and 24th of February, compared more than favourably with previous years. In fact it may be fairly asserted that the Rosebank Show grows in popularity each succeeding year and promises, before long, to outgrow the limits of its present accommodation. The Society is doing a great deal to cope with the increasing demands for space, the most notable feature being the spacious building erected to house the horses. In this the animals can be inspected thoroughly, and loud were the praises of many of the visitors in consequence. The spectacular element is always in evidence at Rosebank, but it was remarked by several regular visitors this year, that there was a larger rural element in the attendance than in years past, and that much interest was centred upon the business side of the Show. This is a very satisfactory indication of the fulfilment of the aims of the Society.

Amongst the many improvements noticeable in the Show, a particularly pleasing feature was the increased facilities for viewing, and, especially, for judging the stock. Two spacious rings were provided for the cattle which greatly helped the work of adjudication; only one class was in the ring at one time and the competing animals had plenty of room to be shown to advantage while interested spectators had every opportunity of watching the process of giving the awards. As this is without doubt one of the most instructive features of any show and one which is apt to be neglected, Rosebank may be held up as a pattern in this respect to other shows, where, as often as not, stock are tied up to trees or hurdles, deserted by their owners. packed close together and arranged so confusedly that likely winners are not infrequently not brought forward, and much annoyance is caused to all parties. Indeed the Committee is to be highly complimented on the arrangement of all these minor details which make or mar the success of a show.

The Society appears to take in a kindly spirit the critical suggestions contained in the judges' reports of previous years, and indeed, encourages such comment. This is as it should be.

The exhibit of implements was a distinct advance on last year, though it still leaves something to be desired and will probably further improve. Many excellent implements were exhibited and a few novelties, amongst others a new form of disc plough on Messrs.

Findlay & Co.'s stand. Hitherto all disc ploughs met with have been sulky wheel ploughs, with a more or less complicated fore-carriage and steering-gear, but this new model, as yet untried in the Colony, consists of a disc like the others, but simply attached to an ordinary swan-neck frame, with short wooden stills and one small wheel under the hake. It is, of course, obviously much simpler, lighter and cheaper than those already in use, but a final verdict must be withheld until it has seen some service. Judged by appearances, it should prove of the greatest use on ordinary lands especially for small spans and on uneven surfaces where the more cumbrous-wheeled affairs with long teams are at a loss.

When irrigation is becoming daily a more and more important matter to our farmers, it is to be regretted that exhibits of this kind are still restricted to engines with pumps sucking water out of a tub and pouring it back again, when there is so much else which farmers want to see in the way of piping, flumes, sluice-gates, syphons, aqueducts, boring plant. etc. A few yards of flumes of different types, plans of existing works, specimen specifications with the articles referred to on view, are likely to be better comprehended by the average man than engines, however efficient, or centrifugal pumps with all the working parts concealed from view.

A new form of Osborne mower, specially intended for cutting lucerne, and a large selection of useful mills for grinding or crushing grain and suitable for hand or mechanical power, were shown by Messrs. G. Findlay & Co.

Messrs. R M. Ross & Co., after some years' absence, were a welcome addition to the show-ground, and offered for inspection an imposing array of farm implements, chiefly those of the well-known Massey Harris make.

Messrs. James Robertson & Co. showed, amongst other features, a fine selection of horticultural and dairy appliances including the Melotte Separator which took first prize in a working trial carried out in the dairy buildings. This contest attracted considerable attention and is a feature of the show which might be turned to even greater advantage than is at present the case. A more searching test might be instituted and the contest made of a more public nature.

Coming to the stock, it may be claimed that the exhibits all round were of an exceedingly interesting character and of good quality. The withdrawal of the Vrede Hoek representatives, owing to the lamented death of the proprietor, the late E. H. F. Mellish, left several serious gaps and reduced the interest in the competition in some of the classes, most notably the Hackneys and Friesland cattle. It was a great blow to the committee to find upwards of seventy of the best entries withdrawn at the last moment, but even with this loss the stock sections all showed up well and were the admiration of all the visitors.

THE CHAMPIONSHIPS.

The Champions in all the sections were the subject of a great deal of attention, and some division of opinion occurred in one notable case, that in which Mr. Abe. Bailey's imported thoroughbred stallion "Leisure Hour," was placed over the De Beers representative "Conroy," last year's winner. "Leisure Hour" is a magnificent animal and offers but little for the most critical to find fault with. His sire was "St. Simon", dam, "Love in Idleness", by "Mask", and he has a career to his credit as well. The S. A. bred champion stallion was found in "Adjutant II." the well known big boned grey hackney, the property of Mr. L. M. G. van Zyl, of Robertson.

In the cattle section there were six championships. The Elsenburg Shorthorn "Manor Favourite" was selected from the heavy breed bulls, and Mr. Jas. Rawbone's Ayrshire "Osborne of Auchenbrach" from the light breed bulls. In the South African bred heavies Mr. S. Van Reenen, of Klapmuts, scored the honours with his Friesland bull while the Porter Reformatory secured the honours in the South African bred light section with a handsome young Jersey bull, "Gondolier," calved in 1903. For champion South African bred (heavy) cow, Elsenburg again scored with "Clare," a handsome young Frieslander, while Mr. Rawbone's "Ruby" (Ayrshire) led the cows of the light breeds.

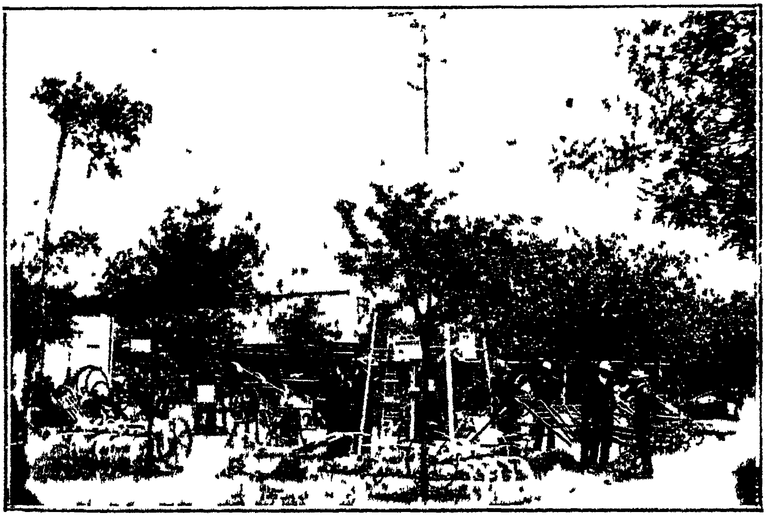
Four championships were awarded for Merino Sheep. The winning ram in the fine woolled section was found in Mr. J. G. Sieberhagen's representative in the four tooth class—a handsome selection. Mr. S. J. Marais, of Dordrecht, provided the champion fine woolled ewe, the winner of the two tooth class. These are both South African bred. In the robust woolled section Mr. H. L. Dugmore of Glencairn, Cathcart, took the honours with his imported Vermont ram and Mr. J. H. King, of Tarkastad took the other championship with a South African bred two tooth ewe. It is distinctly encouraging to see the South African breeders holding their own in woolled stock so creditably, more particularly in the fine woolled sections.

It is to be regretted that there was no championship for Angoras, as we believe it would attract more entries. There is a glamour about championship honours which is always an added attraction to a prize list.

The Judges' reports herewith deal fairly fully with the various sections.

JUDGES' REPORTS.

Wool and Mohair.—The exhibits of hogget's or lamb's grease wool, of merino breed, was beautiful in every respect, quality, and strength. These wools are of excellent length, great strength and firmness, and most desirable in every respect. They shewed what the Colony was capable of producing, nor did the judges think it would be difficult for other farmers in grassveld or mixed veld districts by care to attain to a similar quality. Such wools will easily compete with some of the best clips shipped from Australia, and the results would be most profitable to the farmers as well as to the country.

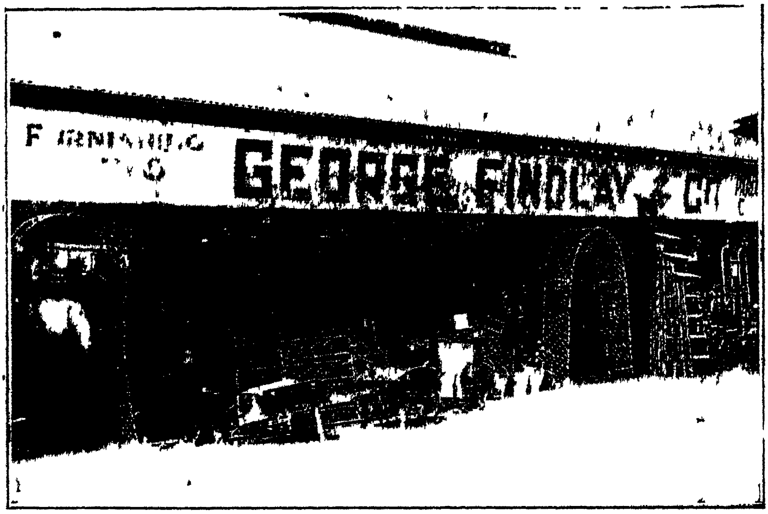


Ostrich Feathers.—The judges reported that, generally speaking, the exhibits of ostrich feathers upon this occasion surpass anything they had seen at Rosebank. There were several entries, and the competition was very close. In the "best variety" class there were five entries, so the allowing of a third prize was recommended. The manufactured feathers were very creditable, and well worthy of the gold medal. The only exhibit of ostrichs on the ground was considered worthy of a first prize.

ANGORA GOATS.—The judges regretted that the exhibits of Angora goats were so few in number. Amongst the entries were some very high bred stock, doing the breeders much credit. Much wise care was bestowed upon some of the exhibits as regards bringing the stock on to the ground in splendid show condition. There remained still room for improving the fleece quality of all the exhibits. The breeders, could, however, be unhesitatingly congratulated upon the undoubted purity of the breed of the splendid exhibits, some of which could claim a position amongst the foremost Angoras of the country.

HORSES.—The judges reported that the exhibit of thoroughbreds was disappointing as regards numbers, many of the classes being represented by only one exhibit, and some of them not in show condition, and bearing evident signs of having been stunted in growth. The exhibits in the imported thoroughbred stallion class were very creditable, the winner being a beautiful stamp of thoroughbred in every respect, and was of exquisite quality. Some fine imported mares were shown. Mr. P Jourdan was awarded a special prize for his South African bred colt, as he was disqualified from competing in that class owing to his not being in the Stud-Book. Mr. J. Rawbone's colt was a very fine horse, and well worthy, of a first prize. Messrs. Mulder Bros.' South African thoroughbred colt was not in show condition, and was not considered worthy of a prize, while Mr. H. C. Gird's South African bred filly was somewhat undersized. Mr. D. de V. Graaff's Califa was a good-looking horse, but rather large for an Arab. The judges on the trained horses, mules, etc., sections reported that the imported carriage horses were good, although there was room for improvement. Mr. J. A. Bester's (Hopefield) were a very useful pair. Mr. H. J. van der Spuy's (Philadelphia) South African bred carriage horses called for special mention. The imported buggy horse was a very good class, and the judges had great difficulty in awarding the prizes. A fine mare "Norah" belonging to the Table Bay Harbour Board, was recommended for a special prize, although she lacked manners. The South African bred buggy horse class was good, and was an improving sort, as were the ponies under 12 hands.

CATTLE.—The judges for the heavy breeds reported that they were sorry that there was so little competition, except in the Friesland cows section, which ran very close, and were an exceptionally good class. The shorthorn class generally was very good. The Friesland bull, which was awarded the championship prize was a grand animal, and a credit to his breeder and owner Mr. Van Reenen, of Klapmuts. The breed of Ayrshire cattle shown, far surpassed both in quality and number any previous exhibition at Rosebank. In the male class, special note should be taken of an aged bull, of a very high quality, and great constitution, which secured not only the first prize in his own class but the male championship for light breeds. Among the younger bulls were a few very promising animals, and it was pleasing to note that they were well cared for, and brought out in excellent show form. In the female section, the exhibits, both imported and Colonial were a very excellent lot, and the improvement of recent years was more than maintained. Jerseys were, though fewer in number, of a very good quality, but showed a slight falling off, as compared with the show of last year. Guernsey cattle were not represented and the judges strongly recommended that the classes for this breed be deleted from the prize list. On the other hand, they urged that separate classes be provided for Kerries and Dexter Kerries. Though the entries were comparatively few in number, those breeds were popular in the south-west of the Colony, and it was difficult for the judges, and confusing to the public to have them grouped together. In Afrikanders it was disappointing to find so few entries. In the group classes the competition in the Ayrshire and Jersey section was keen.



Slaughter Stock.—Slaughter fed oxen were poorly represented, but the quality was good. Slaughter sheep were very good, and the judges had the greatest difficulty in awarding first prizes, but would have liked to have seen more competition. The entries in the " pigs for bacon purposes" were poor, only two entries being received ; those were, however, of good quality.

Pigs.—The judge in the pig section was of opinion that the show was a creditable one, and the specimens exhibited showed a great improvement in quality as compared with those seen at the last meeting. The number of exhibits was disappointing, but all the animals were in good show condition. The specimens of imported Berkshire and Yorkshire pigs were an especially fine lot, and the South African bred Berkshire sows should throw some first class stock. The judge found some difficulty in allotting the prizes in some classes, where no age limit had been made—a necessary condition. He recommended that the same be made a condition in future. Classes should be arranged under age limit conditions. Four and five years old sows were competing with sows of four and five months old, that being the case with the boar classes also.

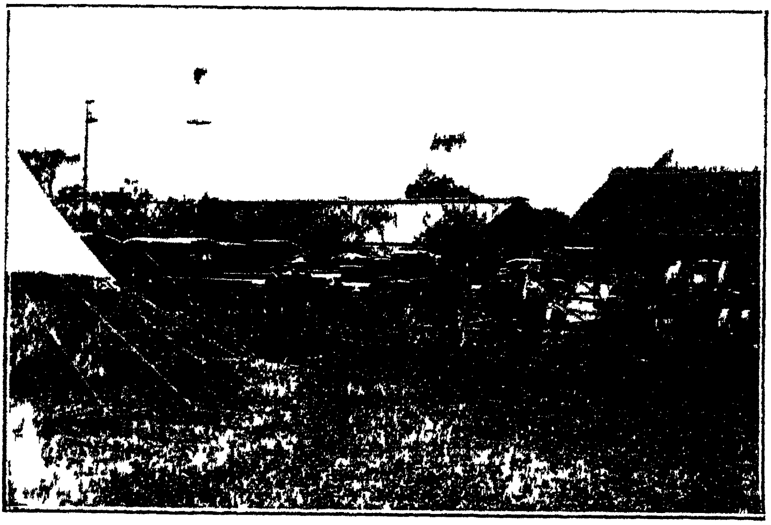
VEGETABLES.—The judges reported that the collections of vegetables shown were of a very high and even quality indeed, the variety being large,: and some difficulty was experienced in placing the awards. Onions occupied a very prominent position, the large number of exhibits being of a very high order. Potatoes were excellent, but not quite so much in evidence as was the case last year. Taken all round, the exhibits of vegetables generally was of a very high order, and would be able to compete in any vegetable show.

FRUIT.—The judges considered the show of fruit very satisfactory. They strongly recommended, in future, that all fruit should be named, and thought it would be as well if the society furnished exhibitors with printed names to place on their exhibits. Export fruit showed a great improvement, in both quality, packing, and condition. It came from the Harbour Board Cold Storage in excellent condition, and showed the best result of cold storage up to date. The judges gave no prize for tomatoes packed for export, as they considered that, if packed in such a manner, they were not a commercial proposition. The judges advised that there should be no prize for tomatoes packed for export, as in their opinion it could not pay to export tomatoes. The judges also suggested that the fruit and grape sections should be divided, and separate judges appointed for each section.

POULTRY.—The judges considered this year's exhibition the best on record. Special mention, they thought, should be made of the following winners: Barred Plymouth Rock cock and hen, Buff Orpington cock and hen, Black Minorca cock and hen, Golden Wyandotte cock, the first and second hens. The same applied to the Silver Wyandotte, the winning hen being a splendid specimen. The winning Indian Gamecock stood out clear from the rest in his class. The White Leghorns, in both classes were birds of considerable merit, and the three winning hens, especially the winner, were exceptional. The winning pen of Buff Orpington chicks contained a few specimens that would be heard of again. The Andalusian winning cock and the three winning hens, especially the first, were exceptional. The exhibits for table purposes were poor. Black fowls, for table use, they considered, should be discouraged; the main points to be aimed at being birds of substance, quality of flesh, combined with white skin and legs, and preferably light-coloured plumage. The judges regretted the absence of a championship prize, and recommended the society, in future, to award a champion medal to both cock and hen classes. They felt that an agricultural show like that of the society's should encourage utility fowls more, and suggested that prizes in future be awarded in this section for dressed and trussed fowls, and also the likeliest bird for laying purposes. Such classes received large support in England, and were immensely popular.

Ramie.—The exhibit is well worth the consideration of farmers who have tracts of land not under cultivation. From the sample displayed the judges feel sure that cotton has a powerful rival, the fabrics displayed are legion, from fine stuff suitable for wearing apparel, to canvas, pump hose etc. The exhibitor states that the samples are manufactured from plants grown in South Africa which makes it doubly interesting.

Tobacco.—The judge regretted that the competition in class 481, (best 25 lbs tobacco in leaf,) was very poor, as South Africa produces a much greater variety than was exhibited. After careful testing No 1502 (Boon Bros., Rustenburg, Transvaal) was awarded first prize, though the exhibitors were strongly advised to pay more attention to the curing of this tobacco as there is quality in it. The second prize (Spies Bros, Oudtshoorn) could be greatly improved if more attention were paid to the handling and more particularly to its curing. Roll tobacco in looch was fair, but no prize was awarded. A very good sample of what is known in the trade as "Heidelberg tobacco" was shown by Mr. P. P. Siebert of Swellendam, and two samples shown by Prince Vintcent &Co., of Oudtshoorn were highly commended.



Cream Separators.—The award was made after the examination of the separators at work. In coming to a decision the main attention was given to the consistency and character of the resulting cream, and thereafter the following points were considered:—construction, materials, simplicity of working, ease of cleaning, devices for regulating the thickness of the cream, time required to separate a given quantity, while finally the capacity of the machine shown and the price were taken into consideration:—Maximum marks 100. Entry 2035—Has an ingenious apparatus for pumping up fresh milk and was first to finish. Besides being somewhat intricate and not readily cleaned, it lost points heavily on account of the cream being altogether too thin. Moreover clots of half churned cream collected on the surface, evidently owing to excessive agitation in the pumping and centrifugal processes. Marks gained 39. Entry 2036 gave rather thick cream, took longer than the other to complete the test, though otherwise satisfactory. Marks gained 65. Entry 2037 furnished excellent cream and thereby secured the advantage in marks, and scored highly both for time and price, marks gained 94. Entry 2038 also gave all round satisfaction and scored 83 marks. Entry 2039 gained full marks for constructional points, but lost on price and on consistency of the cream which was too thick for practical purposes. Marks gained 66. 1st prize No 2037, Messrs. J. Robertson & Co., the "Melotte," second prize No 2038, Messrs. Wesche and McLellan, the "Globe." It is much to be regretted that such inadequate supplies of milk were forthcoming and that owing to regrettable delays before the separated milk could be tested, it had turned sour, also that some of the competitors were not sufficiently familar with their machines to do them full justice. It is suggested that greater facilities be provided at subsequent shows for this trial which might with advantage be made more competitive in character, and that a table of marks be prepared and a larger supply of fresh milk insured. The number of entries and the interest displayed justify such steps being taken for next year.

OFFICIAL PRIZE LIST.

WOOL.

500 lb mixed veld, grass veld, or other than special Karoo grease, properly locked, skirted, and rolled in single fleeces, at least 10 months' and not more than 12 months' growth, grown by the exhibitor: 1, George Blaine, Ross, Kei-road Station; 3, George King and Sons, Wheatlands, Tarkastad. 250 lb hoggets' or lambs' grease wool, of Merino breed, properly locked, skirted, and rolled in single fleeces, at least 10 months' growth, grown by the exhibitor: 1, George Blaine, Ross, Kei-road Station; 2, George King and Sons, Wheatlands, Tarkastad. 20 fleeces of Merino wool in grease, mixed veld, grass veld, or other than special Karoo: 1, George Blaine, Ross, Kei-road Station; 2, George King and Sons, Wheatlands, Tarkastad. 3 ewes' fleeces of Merino wool in grease, mixed veld, grass veld, or other than special Karoo: 1, George King and Sons

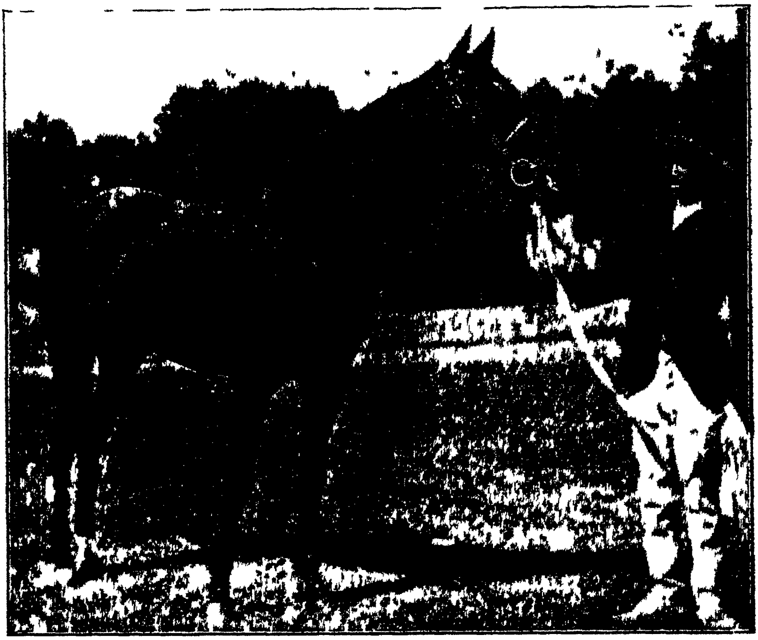
OSTRICH FEATHERS.

1 lb primes: 1, Ockert Fourie, Roodeheuvel, Oudtshoorn; 2, W R Southey, Varkenskop, Schoombie. 1 lb long blacks: 1, W R Southey, Varkenskop, Schoombie; 2, P and P Rabie, Nuy Station, district Worcester. 1 lb long drabs: 1, P and P Rabie, Nuy Station, district Worcester; 2, T and D Hugo, Glen Oak, Nuy, Worcester. 1 lb feminas: 1, Ockert Fourie, Roodeheuvel, district Oudtshoorn; 2, J H Schoeman, jun, Roodeheuvel, district Oudtshoorn; highly commended, W R Southey, Varkenskop, Schoombie. 1 lb white tails: 1, T and D Hugo, Glen Oak, Nuy, Worcester; 2, P and P Rabie, Nuy Station, district Worcester. Best variety, not less than 2 lb in all, and to be of not less than 10 distinct kinds, of not less than 3 oz each, including as under; Whites, medium drabs, medium blacks, mottled, long drabs, long blacks, feminas, white tails, BB tails, femina tails: 1, Ockert Fourie, Roodeheuvel, district Oudtshoorn; 2, W R Southey, Varkenskop, Schoombie; 3, P and P Rabie, Nuy Station, Worcester. Pair of full-grown ostriches in full plumage: 1, Paul J de Wet, Zandvliet, Ashton

Station. Collection of articles manufactured in South Africa from ostrich feathers. 1, Mrs E Young, Strand Street

SHEEP.

Fine Woolled Type Merinos.—Imported pure-bred ewe, not under 2 tooth. 1, C Adams and Son, Glen Roy and Springfield, Tarkastad, 2, C Adams and Son, Tarkastad South African pure-bred ram, 2 tooth 1, J G Sieberhagen, Vlakfontein, district Richmond, 2, J H King, Highland Home, Vogelstruis Nek, Tarkastad; 3, J G Sieberhagen, Vlakfontein, district Richmond South African pure bred ram, not under 4 and not over 6 tooth. 1, and champion, J G Sieberhagen, Vlakfontein, district Richmond; 2 and 3, J H King, Highland Home Vogelstruis Nek, Tarkastad South African pure-bred ram, full mouth: 1 and 3, J H King, Highland Home, Vogelstruis Nek, Tarkastad, 2, J G Sieberhagen, Vlakfontein, district Richmond Pen of 3 South African pure-bred rams, not under 2 tooth: 1, J H King, Tarkastad. 2, J G Sieberhagen, Vlakfontein, 3, George King and Sons, Wheatlands. Tarkastad. South African pure-bred ewe, 2 tooth 1, and champion, S J Marais, Smoorfontein, PO Wolvekloof, Dordrecht. 2, J H King, Tarkastad, 3, J G Sieberhagen, Vlakfontein. South African pure-bred ewe, not under 4 and not over 6 tooth: 1 and 3, S J Marais, Dordrecht; 2, G A Rogers, Elstow, PO Glencairn, Cathcart. South African pure-bred ewe, full mouth. 1, J G Sieberhagen, Vlakfontein; 2, J H King, Tarkastad; 3, George King and Sons, Tarkastad. Pen of 3 South African pure-bred ewes, not under 2 tooth: 1, J H King, Tarkastad' 2 and 3, George King and Sons, Tarkastad. Pen of 6 South African pure bred lambs. under 2 tooth: G J Hamman, Bellevue, PO Tweefontein, Worcester Sire and 4 progeny (2 rams and 2 ewes, not under 2 tooth): 1, J H King, Tarkastad.



The Champion Imported Stallion
Mr. Abe Bailey's Thoroughbred "Leisure Hour."

Robust Woolled Type Merinos.—Imported pure-bred ram, not under 2 tooth 1, and champion, H L Dugmore, Glencairn, via Cathcart, 2, J H King, Tarkastad; 3, S J Marais, Dordrecht. Imported pure-bred ewe, not under 2 tooth. 1. C Adams and Son, Tarkastad; 2, S J Marais, Dordrecht; 3, George King and Sons, Tarkastad; very highly commended, G A Rogers South African-bred ram. 2 tooth: 1 and 3, S J Marais, Dordrecht; 2 and very highly commended, J G Sieberhagen, Vlakfontein.

South African pure-bred ram, not under 4 and not over 6 tooth: G A Rogers, Elstow, PO Glencairn, Cathcart; 2, J G Sieberhagen, Vlakfontein; 3, J H King, Tarkastad. South African pure-bred ram, full mouth: 1, J G Sieberhagen, Vlakfontein; 2, G A Rogers, Cathcart; 3, J H King, Tarkastad. Pen of 3 South African pure-bred rams, not under 2 tooth: 1, J H King, Tarkastad; 2, J G Sieberhagen, Vlakfontein. South African pure-bred ewe, 2 tooth: 1, and champion, J H King, Tarkastad; 2, S J Marais Dordrecht; 3, J G Sieberhagen, Vlakfonrein. South African pure-bred ewe, not under 4 and not over 6 tooth: 1, S J Marais, Smoorfontein; 2, J G Sieberhagen, Vlakfontein; 3, G A Rogers, Glencairn. South African pure-bred ewe, full mouth; 1 and 2, S J Marais, Smoorfontein; 3, J G Sieberhagen, Vlakfontein. Pen of 3 South African pure-bred ewes, not under 2 tooth: 1, J H King, Vogelstruis Nek; 2, George King and Sons, Tarkastad. Pen of 6 South African pure-bred lambs, under 2 tooth: 2, H L Dugmore, Glencairn. Sire and 4 progeny (2 rams and 2 ewes, not under 2 tooth): G A Rogers, Elstow; 2, J H King, Vogelstruis Nek.

Afrikander Sheep.—Pure-bred Afrikander ram, not under 2 tooth: 1, J H Visser, Hopefield; 2, G J Hamman, PO Tweefontein. Pure-bred Afrikander ewe, not under 2 tooth: 1 and 2, G J Hamman, Tweefontein; recommended for special prize, H C Gird, Klipheuvel.

Champion S.A. Bred Stallion.

Mr. L. M. G. van Zyl's Hackney "Adjutant II."

Persian Sheep.—Imported pure-bred ram, not under 2 tooth: 1 and 2, Barry Bros, Cape Town. Imported pure-bred ewe, not under 2 tooth: 1 and 2, Barry Bros, Cape Town. South African pure-bred ram, 2 tooth: 1, Paul J de Wet, Zandvliet, Ashton Station; 2, C P Kloppers, Tweefontein Siding. South African pure-bred ram, not under 4 tooth: 1, and specially recommended, C P Kloppers, Tweefontein; 2, S M Gadd, Springfield, Tafelberg Station; very highly commended, S M Gadd, Springfield, Tafelberg Station. South African pure-bred ewe, 2 tooth: 1, P J de Wet, Ashton; 2 and very highly commended, S M Gadd, Tafelberg Station. South African pure-bred ewe, not under 4 tooth: 1, S M Gadd, Tafelberg; 2, C P Kloppers, Tweefontein Siding;

recommended for special prize P J de Wet, Ashton Station Pen of pure bred lambs under 2 tooth 1, S M Gadd Tafelberg Station 2 Barry Bros Cape Town Pure bred rams, either imported or Colonial, for cross breeding 1, J Gray Waverley road

ANGORA GOATS —South African bred ram 2 tooth 1, Cawood Bros, Mount Stewart 2 and 3 F C Bayly, Jackhalskuilen, via Deelfontein South African bred rams, not under 4 and not over 6 tooth Cawood Bros Mount Stewart 2 and 3, F C Bayly, Jackhalskuilen via Deelfontein South African bred ram full mouth 1, and 2 F C Bayly, Jackhalskuilen Pen of three South African bred rams not exceeding 2 tooth 1, Cawood Bros Mount Stewart 2 F C Bayly, Jackhalskuilen Pen of five South African bred ram kids 1, Cawood Bros Mount Stewart South African bred ewe, 2 tooth 1, Cawood Bros Mount Stewart 2 and 3, and recommended, F C Bayly, Jackhalskuilen. South African bred ewe not under 4 and not over 6 tooth 1, F C Bayly Jackhalskuilen 2 Cawood Bros Mount Stewart Pen of three South African bred ewes not under 4 and not over 6 tooth 1, Cawood Bros Mount Stewart, 2 F C Bayly, Jackhalskuilen Pen of five South African bred ewes not exceeding 2 tooth 1 Cawood Bros Mount Stewart Pen of five South African bred ewe kids 1 Cawood Bros, Mount Stewart

CHAMPION HEAVY BREED BULL

Imported Shorthorn ‘Manor Favourite’ the property of Elsenburg Agricultural College

HORSES

THOROUGHBREDS —Imported stallion combining blood, power, and symmetry 1 and champion, Abe Bailey Arundel 2 De Beers Mines Kimberley highly commended J T Hildebrandt Good Hope Farm, Plumstead Imported thoroughbred mare, combining blood, power, and symmetry 1, Abe Bailey, Arundel 2 James Rawbone, Sir Lowry Pass South African bred colt foaled in 1901 2 J H Visser, Hopefield recommended for special prize, P Jourdan The Pines Hex River Station South African bred colt foaled in 1902 1, James Rawbone Sir Lowry Pass South African bred mare foaled previous to 1901 1, Melck Bros Berg River Hopefield South African bred filly foaled in 1901 H C Bird Prospect Hill, Klipheuvel South African thorough bred filly foaled in 1902 1, James Rawbone, Sir Lowry s Pass South African bred filly, foaled in 1903 1, J Rawbone Sir Lowry Pass specially recommended W G V Carter Groot Schuur

Arabs.—Stallion, imported or South-African-bred: 1, D de V Graaff, Queen Victoria Street, Cape Town. Mare, imported or South African-bred: 1, D de V Graaff, Queen Victoria Street, Cape Town.

Hackneys.—Best imported Stallion: 1 and silver medal, Hackney Society, James Gray, Waverley, Ceres-road Station; 2, recommended, Mountford and Mawle, Klipheuvel. Imported Hackney mare: 1 and silver medal, Hackney Society, Christopher F Moller, Sir George Grey Street, Cape Town. South African-bred colt, foaled in 1902: 1, Paul J de Wet, Zandvliet, Ashton Station. South African-bred colt, foaled in 1903: 1, Paul J de Wet, Zandvliet. South African-bred mare, foaled previous to 1902: 1, Melck Bros, Hopefield. South African-bred filly, foaled in 1902: Paul J de Wet, Ashton Station. South African-bred Hackney filly, foaled in 1903: 1, Melck Bros, Hopefield.

Cleveland Bays.—Stallion, imported or South African-bred: 1, Reitz and Versfeld, Riversdale. Mare, imported or South African-bred: 1, James Rawbone, Sir Lowry Pass. South African-bred colt or filly, foaled in 1901: James Rawbone, Sir Lowry Pass. South African-bred Cleveland colt or filly, foaled in 1902: J A Dreyer, Lower Paarl. South African-bred colt or filly, foaled in 1903: 1, James Rawbone, Sir Lowry Pass.

Champion Light Breed Bull.

Imported Ayrshire, "Osborne of Auchenbrach," the property of Mr. J. Rawbone.

Clydesdales.—Stallion, imported or South African-bred: 1, Elsenburg Agricultural School, Elsenburg. Mare, imported or South African-bred: 1, Elsenburg Agricultural School, Elsenburg; 2, recommended, Table Bay Harbour Board, Cape Town. South African-bred Clydesdale colt or filly, foaled in 1903: 1 and 2, Elsenburg Agricultural School, Elsenburg.

Flemish.—Stallion, imported or South African-bred: 1, F C Bayly, Jackhalskuilen. Mare, imported or South African-bred: 1, A G H Kotze & Son, Lange Riet Vlei, Hopefield. South African-bred colt or filly, foaled in 1902: 1, A G H Kotze & Son, Hopefield. South African-bred colt or filly, foaled in 1903: 1, A G H Kotze & Son, Hopefield.

Other Breeds.—Imported Stallion, not under 15 hands of any recognised pure breed, not provided for in any of the above sections: 1, G J Hamman, Bellevue, PO Tweefontein, Worcester.

Draught Horses (Heavy).—Best South African-bred brood mare: 1, Melck Bros, Hopefield. South African-bred colt, filly or gelding, born in 1903: 1, J A Faure, Zandvliet, Faure Siding. Draught horse for heavy work, to be exhibited in wagon: 1, Table Bay Harbour Board, Cape Town. Horse for Scotch cart or dray work, to be exhibited in vehicle: 1, Table Bay Harbour Board, Cape Town.

Draught Horses (Light).—South African-bred Stallion: 1, and Champion, South African-bred Stallion, Gabriel L. M. van Zyl, Wilde Paarde Kloof, Robertson. South African-bred brood mare: 1, D Hamman, Worcester. South African-bred filly or gelding, born in 1901: 2, De Beers Consolidated Mines. South African-bred filly or gelding, born in 1902: 1, Table Bay Harbour Board, Cape Town. South African-bred colt, filly or gelding, born in 1903: 1, Gideon H van Zyl, Zandvliet, PO Ashton; 2, J P de Villiers, 103, New Street, Beaufort West.

Champion S.A. Heavy Breed Bull.

Mr. S. van Reenen's "Friesland."

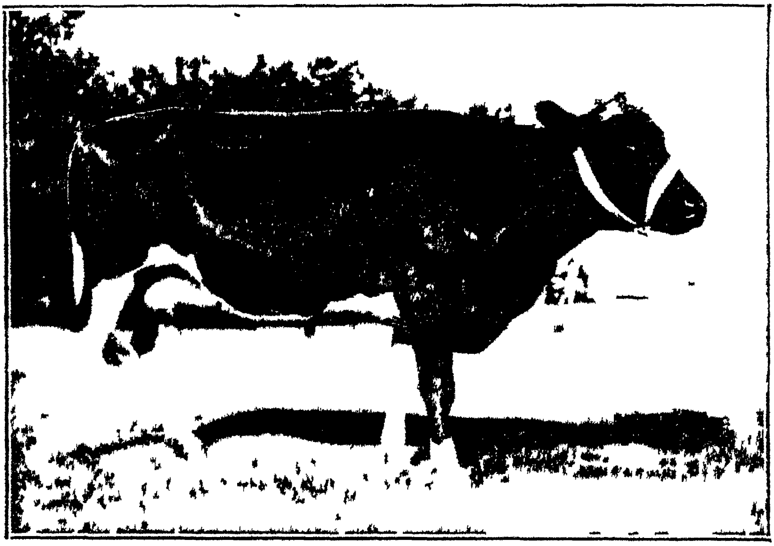
Remounts (Heavy).—South African-bred brood mare: 1, Melck Bros, Hopefield; highly commended, A G H Kotze, Hopefield. South African-bred filly or gelding, foaled in 1901: 1, De Beers Consolidated Mines, Ltd. Kimberley. South African bred filly or gelding, foaled in 1901: 1, De Beers Consolidated Mines, Ltd., Kimberley; 2, Melck Bros, Hopefield. South Arfican-bred colt, filly or gelding, foaled in 1903: 1, Melck Bros, Hopefield; 2 and highly commended, A G H Kotze & Son, Hopefield; highly commended, H C Gird, Prospect Hill, Klipheuvel.

Remounts (Light).—South African-bred brood mare: 1, Melck Bros, Hopefield 2, De Beers Consolidated Mines, Ltd, Kimberley; 3, recommended, P. Broeder, Potsdam, Maitland: highly commended, G J Hamman, Bellevue, PO Tweefontein, Worcester. South African-bred filly or gelding, foaled in 1901: 1, De Beers Consolidated Mines, Ltd, Kimberley; P Broeder, Potsdam. South African-bred filly or gelding, foaled in 1902: 1, Melck Bros, Hopefield; 2, A G Kotze & Son, Hopefield. South African-bred colt, filly or gelding, foaled in 1903: 1, Melck Bros, Hopefield.

Ponies (not exceeding 14·2 hands).—South African-bred stallion: 1, Captain S W Robinson, DAQMG, The Castle, Cape Town. South African-bred brood mare: 1, Melck Bros, Hopefield. South African-bred colt, filly or gelding, born in 1901: 1, A G H Kotze & Son, Hopefield; 2, recommended, H P Ripley Fraserdale Farm.

Mowbray South African bred colt filly or gelding, born in 1902 1, M H van Niekerk, Rocklands Klipheuvel South African bred colt, filly or gelding, born in 1903 1, J Albert Melck, Westwood PO Mamre

CARRIAGE AND CART HORSES —Pair imported carriage horses, not under 15 hands combining power, action and symmetry, to be exhibited in harness, in a carriage 1 John Tregidga, Ivonia, Rosebank Pair South African bred carriage herses, not under 15 hands, combining power, action and symmmetry, to be exhibited in harness in a carriage 1, H J van der Spuy, Kalkfontein, Philadelphia 2, W A Krige, Retreat Stellenbosch, 3, Oatlands, Durbanville Pair South African bred cart horses, not under 14 2 hands, to be exhibited in harness in a cart 1 De Beers Consolidated Mines Ltd, Kimberley, 2, H C Gird, Prospect Hill, Klipheuvel 3, J G Louw, Phisantc Kraal, Durbanville Imported buggy horse, to be exhibited in harness in a vehicle 1 T Bassett West Country Hotel Cape Town, 2, Table Bay Harbour Board, Cape Tow South African bred buggy horse to be exhibited in harness in a vehicle 1, Alf B Wilkinson, Main Street, Newlands, 2 J A Melck



CHAMPION S A HEAVY BREED COW

Friesland "Clare," the property of the Elsenburg Agricultural School

SADDLE HORSES —Imported saddle horse, mare, or gelding, to be exhibited under saddle 1, Mrs Robertson Bertram High Constantia South African bred saddle horse, mare or gelding, to be exhibited under saddle 1, R Sothern Holland, Worsley, Kenilworth South African bred hunter, suitable for hunting at the Cape, up to carrying 14 stone, to be exhibited under saddle 1, F C Bayly, Jackhalskuilen

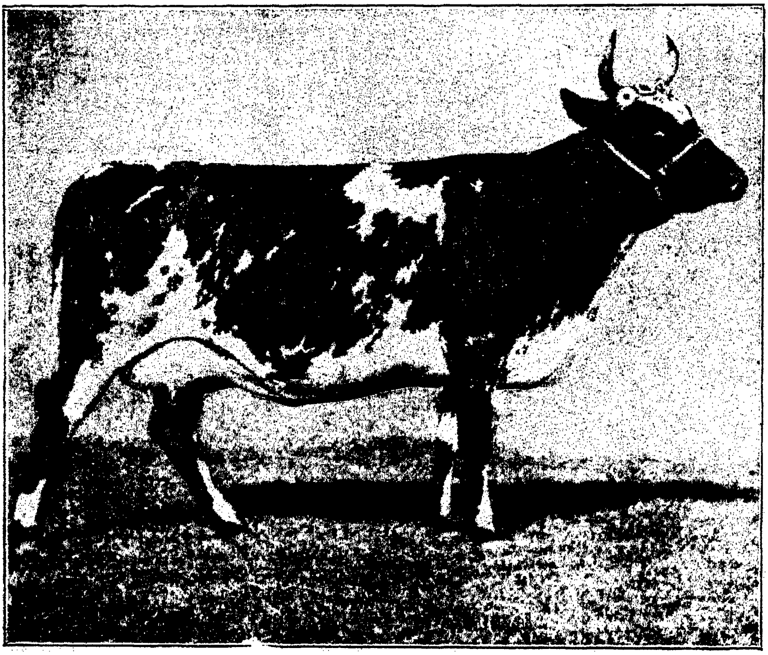
RIDING AND DRIVING PONIES —Pony, over 14 and not exceeding 14 2 hands, to be exhibited under saddle 1 Captain J T Lutley, Government House, Newlands 2, J A Bester, highly commended J C Berrange Pony, over 12 and not exceeding 14 hands, to be exhibited in harness or under saddle 1, F C R Hulin, Randall's Hotel, Rondebosch. Pair ponies over 12 and not exceeding 14 2 hands, to be exhibited in harness F Hendricks Pony, 12 hands and under, to be exhibited in harness or under saddle 1, J H Mitchell, Carisbrook Main Road, Sea Point, recommended for special, Miss Joyce McArthur and P S de Wet Pair ponies 12 hands and under, to be exhibited in harness Mrs T H Anderson

MULES AND DONKEYS —Span South African-bred mules, to be exhibited in harness in a wagon 1, H C Gird, Klipheuvel Pair South African-bred mules, to be exhibited in harness 1, Robt Starke, Durbanville, 2 C G Joubert, Kuils River, recommended for special, J Zeeman Pair South African bred mules, foaled in 1902

J G Louw, Durbanville. Pair South African-bred mules, foaled in 1903: 1, Myburgh Bros, Mulders Vlei. Imported jack-ass for breeding purposes, 14 hands and over, Rob Starke.

CATTLE.

FRIESLANDS.—Imported bull, calved in 1901 or 1902; 1, Elsenburg Agricultural School. Imported heifer, calved in 1902 or 1903: E M Moorhead, Mount Curtis, Wynberg. Imported Friesland cow, calved in 1897, 1898, 1899, 1900, or 1901: 1, D Dekenah jun., 92, Hudson Street, Cape Town, South African-bred bull, calved in 1903 or 1904: 1, Elsenburg Agricultural School. South African-bred Friesland bull, calved in 1901 or 1902: 1, J G Louw, Phisante Kraal, Durbanville. South African-bred bull, calved in 1897, 1898, 1899 or 1900: 1 and champion, S V van Reenen, Klapmuts. South African-bred heifer, bred by exhibitor, calved in 1902 or 1903: 1 and champion, Elsenburg Agricultural School. Pen of three South African-bred heifers, bred by exhibitors, calved in 1902 or 1903: 1, Porter Reformatory, Tokai. South African-bred Friesland cow, calved in 1897, 1898, 1899, 1900 or 1901: 1, Elsenburg Agricultural School.



CHAMPION S.A. LIGHT BREED COW.

Mr. J. Rawbone's Ayrshire "Ruby."

SHORTHORNS.—Imported bull, calved in 1901 or 1902: 1, J W Mason, The Firs, Wynberg Flats. Imported bull, calved in 1897, 1898, 1899, or 1900: 1 and champion, Elsenburg Agricultural School. Imported cow, calved in 1897, 1898, 1899, 1900, or 1901: 1, Elsenburg Agricultural School. South African bred bull, calved in 1903 or 1904: 1, Elsenburg Agricultural School. South African-bred bull, calved in 1901 or 1902: 1, Elsenburg Agricultural School. South African-bred heifer, bred by exhibitor, calved in 1902 or 1903: 1, Elsenburg Agricultural School. Pen of three South African-bred heifers, bred by exhibitor, calved in 1902 or 1903: 1, Elsenburg Agricultural School.

DEVONS.—Imported cow, calved in 1897-8-9, or 1901: 1, C Adams and Son, Glen Roy and Springfield, Tarkastad. South African-bred bull, calved in 1903-4: 1, C Adams and Son, Tarkastad. South African-bred heifer, bred by exhibitor, calved in 1902-3: 1, C Adams and Son, Tarkastad.

HEREFORDS.—Imported bull, calved in 1901-2: 1, James Gray, Waverley, Ceres-road Station. Imported heifer: 1, J Gray, Ceres-road.

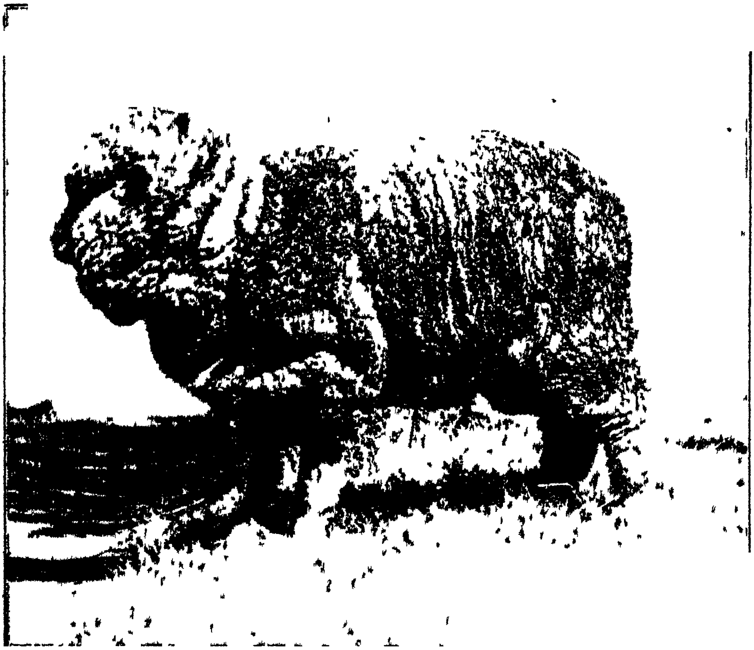
RED POLLS.—Imported bull, calved in 1901-2: 1, E R Ruperti, Klaver Valley, P O Mamre. South African-bred bull, calved in 1903-4: 1, J T Morrison, Firwood, Victoria-road, Stellenbosch. South African-bred bull, calved in 1897-8-9, or 1900: 1, O and N Barry, Rustenberg, Stellenbosch. South African-bred heifer, calved in 1902 or 1903: 1, O and N Barry, Stellenbosch. Pen of three South African-bred heifers, bred by exhibitors, calved in 1902-3: 1, O and N Barry, Stellenbosch. South African-bred cow, calved in 1897-8-9, 1900, or 1901: 1, O and N Barry, Stellenbosch.

AYRSHIRES.—Imported bull, calved in 1901 or 1902: 1, H Reid; 2, H Reid. Imported Ayrshire bull, calved in 1897, 1898, 1899, or 1900: 1, and champion, James Rawbone, Sir Lowry Pass. Imported Ayrshire heifer, calved in 1902 or 1903: 1, James Rawbone, Sir Lowry Pass. Imported Ayrshire cow, calved in 1897, 1898 1899, or 1901: J W J Versfeld, Classenbosch, Wynberg; 2, H Reid. South African-bred Ayrshire bull, calved in 1903 or 1904: 1 and 2, James Rawbone, Sir Lowry Pass. South African-bred Ayrshire bull, calved in 1901 or 1902: 1, James Rawbone, Sir Lowry Pass. South African-bred bull, calved in 1897-8-9, or 1900: 1, J V Duckitt, Modder River. South African-bred Ayrshire heifer, bred by exhibitor, calved in 1902 or 1903: 1, H Reid, Bellville; 2, J V Duckitt. Pen of three South African-bred Ayrshire heifers, bred by exhibitor, calved in 1902 or 1903: 1, James Rawbone, Sir Lowry Pass South African-bred cow, calved in 1897, 1898, 1899, 1900, or 1901: 1, and champion, James Rawbone, Sir Lowry Pass.

CHAMPION FINE WOOLLED MERINO RAM.
The property of Mr. J. G. Sieberhagen.

JERSEYS.—Imported bull, calved in 1901 or 1902: 1, H W Struben, Strubenheim, Rosebank. Imported bull, calved in 1897, 1898, 1899, or 1900: 1, Porter Reformatory Tokai. Imported Jersey heifer, calved in 1902 or 1903: 1, John Tregidga, Ivonia, Rosebank; 2, H W Struben, Strubenheim, Rosebank. Imported Jersey cow, calved in 1897, 1898, 1899, or 1900-1: 1, H W Struben, Strubenheim, Rosebank; 2, Porter Reformatory, Tokai. South African-bred Jersey bull, calved in 1903 or 1904: 1, and champion, Porter Reformatory, Tokai. South African-bred Jersey heifer, bred b exhibitor, calved in 1902 or 1903 : 1 and 2, Elsenburg Agricultural School, Elsenburg. Pen of three South African-bred Jersey heifers, bred by exhibitor, calved in 1902 or 1903 . 1, H W Struben, Strubenheim, Rosebank. South African-bred Jersey cow, calved in 1897, 1898, 1899, 1900, or 1901 : 1, H W Struben, Strubenheim, Rosebank. South African-bred cow, in milk . 1, H W Struben, Strubenheim, Rosebank.

Kerries and Dexter Kerries.—Imported bull, calved in 1897, 1898, 1899, or 1900 : 1, Wm Fletcher, 48, Strand Street, Cape Town. Imported Kerrie cow, calved in 1897, 1898, 1899, 1900, or 1901 : 1, Wm Fletcher, 48, Strand Street, Cape Town. South African-bred bull, calved in 1897, 1898, 1899, or 1900 : 1, Wm Fletcher, Cape Town. South African-bred heifer, bred by exhibitor, calved in 1902 or 1903 : 1, Wm Fletcher, Cape Town. South African bred cow, calved in 1897, 1898, 1899, 1900, or 1901 : 1, Social Farm, Rondebosch. South African-bred cow, in milk : 1, Social Farm, Rondebosch.



Champion Fine Woolled Ewe.

The property of Mr. S. J. Marais, of Dordrecht.

Afrikanders.—Bull, calved in 1901 or 1902 : 1, J H Visser, Hopefield. Heifer, calved in 1902 or 1903 : 1, J H Visser, Hopefield. Cow, calved in 1897, 1898, 1899, 1900, or 1901 : 1, J H Visser, Hopefield. Cow, in milk : 1, J H Visser, Hopefield.

Cross-bred Milch Cows.—3 South African-bred cows, in milk : 1, Social Farm. South African-bred cow, in milk : 1, Social Farm, Rondebosch.

Group Classes.—Heavy breeds (comprising Friesland, shorthorn, Hereford, Aberdeen-Angus, Devon, and polled Suffolk breeds) : 1, Elsenburg Agricultural School (short-horn). Light breeds (comprising Ayrshire, Guernsey, Jersey, and Kerry breeds) : 1, James Rawbone, Sir Lowry Pass ; 2, H Reid, Bellville.

Thorley's Special Prices.—Heifer calf, under 12 months, reared on Lactifer : 1, Elsenburg Agricultural School. Suffolk poll calf, under 12 months, reared on Lactifer : 1, O and N Barry, Stellenbosch. Bull calf, under 12, reared on Lactifer : 1. Elsenburg Agricultural School.

Slaughter Stock.—Two slaughter oxen : 1, H C Gird, Prospect Hill, Kliphouvel; 2, ditto. Two stall-fed oxen : 1, J Tobias Louw, Paarl Station; 2, P J Bosman, H son, Kuil's River. Ten merino wethers: 1, Robert Starke, Oatlands, Durbanville; 2, C Briers, Eenzaamheid, Klapmuts. Ten Cape or cross-bred wethers : 1, C Briers, Klapmuts; 2, J H Visser, Hopefield; highly commended, G J Hamman, P O, Tweefontein, Worcester. Five Kapater goats: 1, Robert Starke, Durbanville; 2, J H Visser, Hopefield. Hand-reared sheep : 1, G J Hamman, Bellevue, P O, Tweefontein ; 2, J P Bosman, H son, Kuil's River; highly commended, G J Hamman, Tweefontein. Pig, for bacon purposes : 1 and 2, R Pintlebury, Claremont.

PIGS.

Berkshires.—Imported boar : 1, Social Farm, Rondebosch ; 2, Porter Reformatory, Tokai. Imported sow : 1 and 2 Porter Reformatory, Tokai. South African-bred boar: 1, Social Farm, Rondebosch; 2, Porter Reformatory, Tokai. South African-bred sow: 1 and 2, Social Farm, Rondebosch.

Yorkshires (Middle or Small).—Imported boar : 1, Marsh Memorial Homes, Rondebosch. Imported sow : 1, Marsh Memorial Homes, Rondebosch. South African-bred boar : 1 and 2, Social Farm, Rondebosch. South African-bred sow : 1 and 2, Marsh Memorial Homes, Rondebosch.

Any Other Breed.—South African-bred boar : 1, B F van Niekerk, Rust en Vrede, Wynberg. South African-bred sow : 1, B. F. van Niekerk, Wynberg. Barrow pig : 1, R. Pintelbury, Claremont. Sow, with not less than six sucking pigs : 1, Marsh Memorial Homes, Rondebosch ; 2, A Scott, Vineyard Hotel, Newlands.

POULTRY.

Turkey cock, any variety : O and N Barry, 1 ; H G Greef, Malmesbury, 2. Turkey hen : H G Greef, 1 and 2. Embden or Toulouse gander : Social Farm, Rondebosch, 1 and 2. Embden or Toulouse goose : Social Farm, 1 ; H Heese, Paarl, 2. Aylesbury drake : C Soderland, Bellville, 1 ; W R Thomson, Maitland, 2. Aylesbury duck : H C Stark, 1 and 2 ; W R Thomson, 3 and highly commended ; H Heese, very highly commended. Rouen drake : H Heese, 1 ; Myburgh Bros, very highly commended. Rouen duck : H Heese, highly commended; Myburgh Bros, commended. Drake, any variety : Social Farm, 1 2, and 3 ; B F van Niekerk, very highly commended. Duck, any variety : Social Farm, 3 and very highly commended. Langshan cock : N A Axe, Somerset West, 1 ; A B Wilkinson, Newlands, 2 and very highly commended ; S T Hocking, 3. Langshan hen : N A Axe, 1 ; E Runnals 2 and 3 and commended. Black Orpington cock : J Templar, Cape Town, 1 ; C Muller, 2 ; H C Stark, commended. Black Orpington hen : J Templar, 1, 2 and 3 ; C Muller, very highly commended. Buff Orpington cock : J Templar, 1 and 2 ; O and N Barry, 3 ; Social Farm, highly commended. Buff Orpington hen : J Templar, 1, 2 and 3 ; A A Colville, very highly commended and 2 highly commended ; E H Winter, highly commended. Barred Plymouth Rock cock : P T Martin, Cape Town, 1 ; J Templar, 2 and 3 ; W R Thompson, highly commended. Barred Plymouth Rock hen : J Templar, 1, 2 and 3 ; P T Martin, very highly commended and highly commended ; W H L Gillard, highly commended. White or Buff Plymouth Rock cock : Elsenburg Agricultural School, 1 ; O and N Barry, 2. White or Buff Plymouth Rock hen : Elsenburg Agricultural School, 1. Brahma cock, any colour : Social Farm, 1 ; J M Theunissen, 2 and 3. Brahma hen, any colour : T Whittaker, 1 ; J M Theunissen, 2 and 3. Cochin cock, any colour : Social Farm, 1 and 2. Cochin hen, any colour : Social Farm, 1 and 3 and highly commended. Dorking hen, any variety : A E Plant Rondebosch, 1 and 2. Black Minorca cock : J Templar, 1 and 3 ; A G Martin; Cape Town, 2 ; A H Mortimer, very highly commended ; Social Farm, highly commended Black Minorca hen : J Templar, 1, 2 and 3 ; C Muller, very highly commended ; J T Chenowith and A G Martin, highly commended. Golden Wyandotte cock, N A Axe, 1 and 2 ; W. Bullen, 3. Golden Wyandotte hen : N A Axe, 1 and 2 ; W K Hunt, 3. Silver Wyandotte cock : N A Axe, 1 ; W K Hunt, Newlands, 2 and 3. Silver Wyandotte hen : C C Gilbert, Observatory, 1 and 2 ; W K Hunt, very highly commended ; N A Axe, highly commended. Wyandotte cock, any variety : Social Farm, 1 ; Abe Bailey, Arundel, C C, 2 ; J Templar, 3 ; J T Chenoweth, very highly commended. Wyandotte hen, any variety : J Templar, 1 and 3 and very highly commended ; S Smith and Social Farm, highly commended. Indian or Malay Game cock : W G Carter, Rondebosch, 1 ; W Bullen, Maitland, 2 ; J Templar, 3. Indian or Malay game hen : W G Carter, 1 and 2 and highly commended , J Templar, 3 and very highly commended. Game hen, any other variety : T Bennett, Kenilworth, 1 ; S and

C Jackson, Wynberg, 2 and 3. White Leghorn cock: J Templar, 1 and 2. White Leghorn hen . J Templar, 1, 2 and 3; R Archibald, very highly commended. Brown Leghorn cock: S Smith, Rondebosch, 1; Social Farm, 2; C Soderland, 3. Brown Leghorn hen: J Templar, 1, 2 and 3: S Smith, very highly commended. Leghorn cock, any other colour: A G Martin, 1; W Sleep, very highly commended, W Howes, highly commended. Leghorn hen, any other colour: W Howes, Cape Town, 1 and highly commended; A Jarman, Claremont, 3. Black Hamburgh hen: Social Farm, 1. Andalusian cock · J Templar, 1; J P Seabrook. Kenilworth, 2. Andalusian hen: J Templar, 1, 2 and 3; J Seabrook, very highly commended and three highly commendeds Best cock, any variety not classed: H C Starke, highly commended (Golden-laced Orpington) Best hen, any variety not classed: H C Starke, highly commended (Golden-laced Orpington). Best brood of not less than four chickens, any breed, not less than three months: A E Plant, 1; A Jarman, 2; Social Farm, 3; B Manning, very highly commended; Elsenburg Agricultural School, highly commended. Breeding pen, any pure breed, cock and three hens: J Templar, 1; P T Martin, 2; Social Farm, 3 and very highly commended; A Bailey, Arundel, C C, highly commended. Pen of table fowls: Social Farm, 3 Pen of ducks for table use: G S King, 1; B F van Niekerk, 2. Cochin or Pekin Bantam cock: J Templar, 1; R Smith, 6; M J Saul, highly commended. Cochin or Pekin Bantam hen: J Templar, 1, 2 and 3; R Smith, very highly commended Black or brown red game Bantam cock: M J Saul, 1, 2 and 3. Black or brown red game Bantam hen: M J Saul, 1, 2, 3 and commended. Duckwing or pile game Bantam cock: M J Saul, 1 and 3. Duckwing or pile game Bantam hen: M J Saul, 1 and 3. Special prize for Cyphers incubators: Geo Findlay & Co. Also one for poultry appliances, foods, medicines, etc.

Champion Robust Woolled Merino Ram.

The property of Mr. H. L. Dugmore, of Glencairn, Cathcart.

AGRICULTURAL PRODUCE AND SOUTH AFRICAN MANUFACTURES.

Butter and Cheese.—Twenty-five pounds of salted butter: 1, Mrs M Melck, Kersefontein, Hopefield 2, Mrs Ryk Melck, Doornfontein, Hopefield; 3, Myburgh Bros, Joostenburgh, Mulder's Vlei. Five pounds of fresh butter: 1, H W Struben

Strubenheim, Rosebank; 2, R D Wyllie, Elsenburg, Mulder's Vlei; 3, J A Briers, Klapmuts.

Bacon and Hams.—Side of cured bacon: 1, S C Skaife, Glen Lion, Bloemfontein. Cured ham: 1, S C Skaif, Bloemfontein; highly commended, J D Celliers, Lange Rug, Paarl.

Honey, etc.—Twelve pounds of honey; 1, J P Cloete, Langeriet Vlei, Hopefield. Twelve quart jars honey in comb: 1, J P Cloete, Hopefield. Twelve quart jars of extracted honey: 1, J P Cloete, Hopefield. Best and largest exhibit of honey, extracted: 1, J P Cloete, Hopefield. Ten pounds of beeswax: 1, Miss Sophie Beyers, Simondium, Paarl.

Preserved Fruit, etc.—Candied or crystallised, not less than 50 lb weight: 1, Miss Alice Beyers, Riversmeet, P.O. Simondium; 2, Mrs W P Frisby, Rouwkoop-road, Rondebosch. Assortment of sauces, three bottles each variety: 1, Miss N Brandon, The Hill, Somerset West; 2, Miss S Beyers, Simonnium. Six bottles of sugar-bush syrup: 1, Miss S Beyers, Simondium; 2, Mrs David Beyers, Simondium. Assortment of preserved vegetables, all sorts: 1, Miss S Beyers, Simondium; 2, Mrs D Beyers, Simondium. Assortment of pickles, not less than one dozen 2 lb jars or bottles: 1, Miss S Beyers, Simondium. Assortment of chutneys, not less than one dozen 1-lb jars or bottles: 1, Mrs E M Liddell-Williams, Alphen Hill, Wynberg; 2, Miss S Beyers, Simondium. Assortment of preserved fruits, one dozen 2-lb jars or bottles: 1, Miss S Beyers, Simondium; 2, Mrs H M Dreyer, College-square, Stellenbosch, and Mrs D Beyers, Simondium. Largest assortment of preserved fruits: 1, Mrs D Beyers, Simondium; 2, Miss S Beyers, Simondium. Jams, not less than one dozen 2-lb jars or bottles: 1, Mrs. D. Beyers, Simondium; 2, Miss S Beyers, Simondium. Marmalade, not less than one dozen 2-lb jars or bottles · 1, Mrs H M Dreyer, Stellenbosch; 2, Miss S Beyers, Simondium. Jellies, not less than one dozen 1-lb jars or bottles; 1, Miss S Beyers, Simondium; 2, Mrs H M Dreyer, Stellenbosch. Assortment of canned fruits, suitable for export: 1, Miss S Beyers, Simondium.

Lard.—Twenty-five pounds of lard: 1, Miss S Beyers, Simondium.

Confectionery.—Assortment of confectionery, not less than 100 lb: 1, Hickson and Sons, Woodstock.

Fish.—Twenty pounds ingelegde fish: 1, Mrs H Kingsley, Murchiston, Rondebosch; 2, Mrs W P Frisby, Rondebosch.

Tobacco.—Twenty-five lb in leaf: 1, Boon Bros and Co, Rustenburg, Transvaal; 2, recommended, Spies Bros, P.O. Schoemanshoek, Oudtshoorn.

Cereals.—Three bushels Baard wheat: 1, A G H Kotze and Son, Lange Riet Vlei, Hopefield; 2, T J Louw, jun, Porselainburg, Malmesbury. Three bushels Du Toit wheat: 1, Melck Bros, Berg River, Hopefield; 2, T J Louw, jun, Malmesbury. Three bushels Rietti wheat: 1, R A Morkel, Rome, Somerset West; 2, C Briers, Klapmuts. Three bushels any other variety: 1, A G H Kotze and Son, Hopefield; 2, Melck Bros, Hopefield. Largest collection new wheats for seed purposes: 1, R Starke, Durbanville. Three bushels oats: 1, R Starke, Durbanville. Three bushels oats grown from imported seed: 1, R Starke, Durbanville; 2, T J Louw, jun, Malmesbury. Three bushels rye: 1, Melck Bros, Hopefield; 2, P A B Faure, Bleak House, Faure Siding Bushel barley wheat: 1, R A Morkel, Somerset West. 200 lb yellow mealies: 1, R A Morkel, Somerset West. 200 lb white mealies: P and P Rabie, Nuy Station, near Worcester.

Flour and Meal.—200 lb flour from South African wheat: 1, S A Milling Co. 200 lb flour milled in the Colony: 1, S A Milling Co, Cape Town. 200 lb meal from South African wheat: 1, S A Milling Co. 200 lb meal milled in the Colony: 1, S A Milling Co.

Hay.—Bale oathay, not less than 150 lb weight: 1, Fechter & Co, Paarl (Algerian); 2, H C Gird, Klipheuvel. Bale Lucerne hay, not less than 100 lb weight: 1, S M Gadd, Tafelberg Station: 2, H S Greeff, Laingsburg.

Root Crops.—Twelve roots long mangel wurzles: 1, T Mossop, Bollihope, Mowbray. Roots swede turnips: 1, O and N Barry, Stellenbosch.

Peas and Beans.—100 lb white beans: 1, R A Morkel, Somerset West; 2, J Rawbone, Sir Lowry Pass. 100 lb Natal or sugar beans: 1, R A Morkel, Somerset West; 2, J Rawbone, Sir Lowry Pass. 100 lb red beans: 1, R A Morkel, Somerset West.

VEGETABLES.

Collection vegetables: P Lester, Classenbosch, Wynberg, 1; Doble Bros, Retreat, 2. French beans: P Lester, 1. Beetroots: P Lester, 1; Doble Bros, 2. Brussels sprouts: P Lester, 1. Cabbages, any variety: P Lester, 1. Cabbages, red picklings: P Lester, 1. Carrots, Shorthorn: P Lester, 1; G S King, Durbanville, 2. Cauliflowers: Doble Bros, 1. Celery: Doble Bros, Retreat, 1. Cucumbers, grown in the open: G W Voigt, Diep River, 1; P Lester, 2. Cucumbers, pickling: Doble Bros, 1; P Lester, 2. Collection herbs: P Lester, 1, Knohl kool: Doble Bros, 1, Leeks: P Lester, 1; B F Van Niekerk, Wynberg, 2. Cabbage lettuces: P Lester, 1; G Buckley, Constantia, 2. Onions: H O Arton, Groot Drakenstein, 1; A G H Kotze and Son, Hopefield, 2. Parsnips, long: P Lester, 1; Doble Bros, 2. Peas: P Lester, 1. Rhubarb: P Lester, 1. Potatoes, red or white: P Lester, 1; Doble Bros, 2, Collection of potatoes for table use: Doble Bros, 1. Pumpkins: B F Van Niekerk, 1; P Lester, 2. Scorzonera: P Lester, 1: G Buckley, 2. Tomatoes, suitable for export: Doble Bros, 1; G S King, 2. Collection of tomatoes: Doble Bros, 1,; A L Wilmot, Observatory, 2. Vegetable marrows custard: G S King, 1; P Lester, 2. Vegetable marrows, long: Doble Bros, 1; B F Van Niekerk, 2.

FRUIT.

Assortment dried fruits: Miss S Beyers, Paarl, 1; Mrs D Beyers, 2. Dried apricots: R S Falcon, Wellington, 1; A Nicholson, Stellenbosch, 2. Dried prunes, D'Agen: D Koch, Simondium, 1; R J Bulmer, Groot Drakenstein, 2. Dried almonds: Miss S Beyers, 1. Dried mebos: G W Johnston, Cape Town, 1; Miss S Beyers, 2. Dried apricots (1,000 lb): R S Falcon, 1. 1,000 dried prunes (in boxes): D Koch, 1. Collection fresh fruit: G Buckley, Constantia, 1; O and N Barry, Stellenbosch, 2. 9 dishes ripe dessert fruit: A Nicholson, 2. 6 dishes ripe dessert fruit: O and N Barry, 1; A Nicholson, 2. Collection plums: O and N Barry, 1. Japanese plums: H O Arton, 1. Damask plums: A Nicholson, 1. Ponds seedling plums: O and N Barry, 1; A Nicholson, 2. Any variety plums: A Nicholson, 1. Burbank plums: O and N Barry, 1; H O Arton, 2. Kelsey plums: O and N Barry, 1; H O Arton, 2. Wickson plums: H O Arton, 1. Satsuma plums: O and N Barry, 1. Ogan Magato plums: O and N Barry, 1. Any variety Japanese plums: H O Arton, 1; D Joubert, Ceres, 2. Prune, D'Agen plums: H O Arton, 1. Gages: H O Arton, 1. Largest collection apples: Cape Orchard Co, Ltd, Hex River, 4: Gie Bros, 2. Collini apples: G Buckley, 1; D Joubert, 2 Warner's King apples: D A Joubert, 1; G Buckley, 2. Jonathan apples: A Nicholson, 1. Ribstone pippins: A Nicholson, 1; D Joubert, 2. Ohenimuri apples: D Joubert, 1. Sturmer apples: D Joubert, 1. Lord Wolseley apples: D Joubert, 1. Any other variety apples: Myburgh Bros, 1; D Joubert, 2. Largest collection grapes: W H Lategan, Constantia, 1. Largest collection table grapes: W H Lategan, 1. Ripe dessert grapes: W H Lategan, 1. Red grapes: W H Lategan, 1: G Buckley, 2. White grapes: W H Lategan, 1; G Buckley, 2. White Muscadel grapes; W H Lategan, 1. Frontignac grapes: W H Lategan, 1. White crystal grapes: W H Lategan, 1. Red Muscadel grapes: W H Lategan, 1. White Hanepoot grapes: W H Lategan, 1; G Buckley, 2. Red Hanepoot grapes: G Buckley, 1; W H Lategan, 2. Canaan grapes: W H Lategan, 1. Hermitage grapes: W H Lategan, 1; O and N Barry, 2. White green grapes: W H Lategan, 1. Red green grapes: W H Lategan, 1. Barbarossa grapes: W H Lategan, 2. Stemgrapes: W H Lategan, 1; B F van Niekerk, 2. Riesling grapes: W H Lategan, 1. Cabernet de Sauvignon grapes: W H Lategan, 1. Verdot grapes: W H Lategan, 1. White French grapes: W H Lategan, 1. Lady Downe red grapes: W H Lategan, 1. Raisin Blanc grapes: W H Lategan, 1. Any other variety grapes; W H Lategan, 1. Largest collection pears: Cape Orchard Co, 1; A Nicholson, 2. Duchesse D'Angouleme pears: H O Arton, 1. Saffron pears: D Joubert, 1. Doyenne de Comice pears: A Nicholson, 1. Louise Bonne pears: H O Arton, 1; O and N Barry, 2. Beurre Hardy pears: H O Arton, 1. Beurre Clairgeau pears: A Nicholson, 2, Williams Bon Chretien pears: D A Joubert, 1; W H Lategan, 2. Beurre Bosc pears: H O Arton, 1; O and N Barry, 2. Glout Morceau pears: H O Arton, 1; A Nicholson, 2. Beurre Capeaumonde; Myburgh Bros, 1. Beurre Diel pears: 1, H O Arton, 1, Beurre superfine pears: A Nicholson, 2. Keiffer pears: O and N Barry, 1; H O Arton, 2. Winter Nelis pears: A Nicholson, 1; H O Arton, 2. Clapp's favourite pears: A Nicholson, 2. Durondeau pears: A Nicholson: 1. Stewing pears: A Nicholson, 1. Any other variety pears: A C Buller, Stellenbosch, 1. Gladstone peaches: G Buckley, 2 Sea Eagle peaches: A Nicholson, 1. Solway peaches: A Nicholson, 1. Collection figs: A Nicholson, 1. Dessert figs: A Nicholson, 1. Cape White figs: R L Starke, jun, Durbanville, 1. White Genoa figs: A Nicholson, 1, Portugal lemons; A Nicholson, 1. Round green flesh melons: R L

Starke, 1. Scarlet flesh melons R L Starke, 1. Any other variety melons: B F van Niekerk, 1. Icecream watermelons. B F van Niekerk, 1. Mountain sweet melons: W H Lategan, 1. Ironclad melons: W H Lategan, 1. Any other variety melons F van Niekerk. 1.

MISCELLANEOUS.—Dish almonds: A Nicholson, 1: H O Arton, 2. Bunch bananas: J A Dreyer, Paarl, 1. Plantains. J A Dreyer, 1 and 2. Quinces: H O Arton, 1. Cape gooseberries: Doble Bros, 1. Grapes, packed for export: W Lock. Stellenbosch 1. Peaches, packed for export: A Nicholson, 1. Pears, packed for export: H O Arton, 1. Apples, packed for export: H O Arton, 1. Japanese plums, packed for export · H O Arton, 1. Plums (any), packed for export: A Nicholson, 2. Fruit (any), packed for export: A Nicholson, 1. Pears (5 boxes), packed for export. H O Arton, 1.

CHAMPION ROBUST WOOLLED EWE.
The property of Mr. J. H. King, of Tarkastad.

SOUTH AFRICAN MADE VEHICLES.—Landaus: 1, Reynolds' Vehicle and Harness Factory, Claremont. Four-wheeled dog cart: 1, King Bros. Durbanville; 2, T C Parsons, 29, Buitenkant-street, Cape Town. Four-seated Cape cart, painted: 1, King Bros, Durbanville. Four seated Cape cart, varnished: 1, King Bros, Durbanville. Two-seated Cape cart, painted: 1, Retief, De Ville and Co, Paarl. Two-seated Cape cart, varnished: 1, King Bros, Durbanville. Open village cart: 1, London Carriage and Wagon Works, Barron-street, Cape Town. Ralli cart: 1, Reynolds Vehicle and Harness Factory, Claremont. Four-seated open cart for country use: 1, King Bros, Durbanville. Scotch cart, Cape pattern, with or without raves: 1, King Bros, Durbanville. Milk cart: 1, London Carriage and Wagon Works, Cape Town. Parcel delivery cart, animal draught: 1, London Carriage and Wagon Works, Cape Town. Farm wagon, without tent, unpainted: 1, King Bros, Durbanville. Dock wagon, without raves: 1, King Bros, Durbanville. Wagon, with raves, for any class of work: 1, King Bros, Durbanville. Market gardeners' wagon: 1, T C Parsons, Buitenkant-street, Cape Town. Parcel delivery van: 1, London Carriage and Wagon Works, Cape Town, Municipal street watering van: 1 King Bros, Durbanville. Collection of vehicles manufactured by exhibitor, and entered for competition in any of the above classes: 1. King Bros, Durbanville.

MACHINERY AND AGRICULTURAL IMPLEMENTS.

Collection of agricultural implements and machinery, the latter to be shown in motion as far as possible: 1, Geo Findlay & Co, 18, Parliament-street, Cape Town; 2, R M Ross & Co, Strand-street, Cape Town. Collection of viticultural and horticultural implements: 1, Jas Robertson & Co, Plein-street, Cape Town; 2, Geo Findlay & Co, Cape Town Exhibit of spraying pump and appliances: 1, Geo Findlay & Co, Cape Town; Jas Robertson & Co, Cape Town. Collection of wine-making appliances, including presses, pumps, etc: 1, Geo Findlay & Co, Cape Town; 2, W Voight, Germania Works, Lady Grey Bridge. Collection of irrigation plant and pumps: 1, Geo Findlay & Co, Cape Town. Collection of dairy appliances; 1, Geo Findlay & Co; 2, J Robertson & Co. Cream separators: 1, J Robertson & Co; 2, Wesche & McLellan, East London. Oil engine, suitable for farm purposes: 1, Govey & Co, 26, St George's-street, Cape Town; 2, Smuts and Koch, Malmesbury. Windmill: 1, Geo Findlay & Co, Cape Town.

SPECIAL EXHIBITS.—Fencing, etc.: 1, Cyclone Gate and Fencing Co. A Colonial made oathay press (Messrs. D E Scott & Co), a Colonial-made improved brandy still (W Voight, Lady Grey Bridge), and a stukvat, etc., (Mr J A Smith, Pepper Street, Cape Town), were recommended for prizes.

CAPE WINES, BRANDY, ETC.—Five leaguers Cabernet Sauvignon: E K Green & Co, Cape Town. Five leaguers Hermitage: 1, Paarl Wine and Brandy Co. Five leaguers dry pontac: 1, E K Green and Co, Cape Town. Five leaguers sherry: E K Green and Co Cape Town. Five leaguers hock: E K Green and Co, Cape Town. Five leaguers dry red Muscadel: 1, E K Green and Co, Cape Town. Four varieties sweet wine, each representing not less than two leaguers: 1, H C Collison, Cape Town; very highly commended, Van Rhyn Wine and Spirit Co, Cape Town. Two leaguers of brandy, other than dop (10 per cent under proof): 1, Van Rhyn Wine and Spirit Co. Two leaguers dop brandy (10 per cent under proof): 1, Van Rhyn Wine and Spirit Co; very highly commended, E K Green and Co, Cape Town. Leaguer spirits of wine (38 degrees over proof): Barry Bros, Cape Town. Leaguer spirits of wine (65 per cent over proof): 1. Paarl Wine and Brandy Co. Leaguer whiskey (10 per cent under proof): 1, E K Green and Co, Cape Town. Eight gallons Van der Hum: 1, Paarl Wine and Brandy Co. Eight gallons orange liqueur: 1, E K Green & Co, Cape Town. Eight gallons aniseed liqueur: 1, E K Green & Co, Cape Town. Leaguer vinegar: 1, Van Rhyn Wine and Spirit Co, Cape Town. Half hogshead lager Beer: 1, Ohlsson's Cape Breweries, Cape Town. Half hogshead stout: 1, Ohlsson's Cape Breweries. Assortment of bitters: 1, Western Wine and Brandy Co, Lady Grey Bridge A special exhibit by Ohlsson's Cape Breweries was recommended for a special prize.

THE SOUTH AFRICAN HORSE.

BY A SOUTH AFRICAN BREEDER.

Last month we gave our readers the benefit of some interesting and thoughtful opinions expressed by the chief Veterinary Surgeon on the Cape Horse. Our attention has since been called to another interesting contribution on the same subject written by the well-known breeder, Mr. Alex. Robertson of Colesberg, to the Bloemfontein *Friend.* Mr. Robertson says:—

The Colonial Horse, since his merits were discovered in the late war, has been attracting a considerable amount of public notice, and it has been suggested to form a stud book for the purpose of registering and thereby keeping the breed pure. Hundreds of fine brood mares and foals were ruthlessly destroyed during the war, and to day, few of the farmers who were considered successful horse breeders have a single colonial mare left. It means that they will have to start afresh, and in my opinion, to regain what we have lost, the wisest policy to adopt would be to favour the animal that made our reputation and that was

THE THOROUGHBRED.

He is the survival, as a rule, of the fittest, being bred only from animals that have stood the severe test of the race course, and we know that in other countries, Austria, Russia, Germany, France, and, in fact, in every temperate part of the world, the English thoroughbred has completely supplanted every horse for fast work. The climate, soil, and the requirements of each country have stamped a peculiar character on the horses produced in it. Mr. Allison, in *The British Thoroughbred* shows us how local influences act on the external characteristics of a breed however pure, and quotes India as a country where the British thoroughbred will degenerate to the level almost of the country-bred, if imported stock is not constantly used. Australia and New Zealand have their type, and the Waler can hardly be mistaken on any race-course. The Grafter was a good specimen of the type, and it was said that such a horse could hardly by any possibility have been bred in England. And yet he was got by an imported English sire out of a mare whose sire and dam were English. Horses bred here from thoroughbred stock do not, as far as I know, alter in character to any appreciable extent. They certainly deteriorate in size, but probably much could be done by feeding to remedy this. We do know, however, that as a rule they are sound, and for endurance can't be beaten. Before the war they were rejected simply because they were lacking in stature, which in my opinion was a great mistake. I never lost an opportunity of expressing my opinion that way when I saw remount officers rejecting fine short legged cobs because they did not reach the 14·2 standard, and accepting leggy weeds because they happened to be the requisite height. Also hundreds of coarse-bred useless brutes were imported from Argentina simply because they came up to the measurement standard. These were absolutely useless when put to the test, and I am sure that every officer who had to do with horses here will give

OUR LITTLE HORSE

the credit he deserves. I know he can be improved, but if bred from a good thoroughbred sire it will only be in the way of feeding from his foalhood. I do not believe that horses out here mature as fast as they do in England, but if they grow slower they are sounder, and, in my opinion, last longer. In the fifties the Hantam horse had a great reputation, and was eagerly purchased for cavalry work in India. Now going back to those days, we find that nothing but the thoroughbred was used as a sire. I have often had interesting conversations with Mr. D. Oosthuizen on horse breeding in the early days, and he remembers most of the sires then used, such for instance, as Sir Hercules, imported *in utero*, and son of the famous Irish horse of the same name; War Eagle; Evenus, etc. Mr. Oosthuizen rode from Colesberg early in the fifties with the money in his saddlebags to buy an imported horse called Tally Ho. On his arrival, and after a careful inspection of the horse he decided to buy another thoroughbred that happened to be in the market. This was the beautifully bred Turpin who, for several seasons, stood at Hanglip in this district, where he probably got many a good foal. Evenus, we find, was a winner of the Cambridgeshire, and out of Marpessa, dam of Pocahontas. With sires of this class, and the veld everything to be desired, is it a wonder that good animals were bred? Since then, through

DROUGHT AND OVER-STOCKING.

the country has become quite unsuited to the rearing of horses. The bigger the breed the worse they will naturally do. Hence the fatal mistake of using any of the heavy fleshy breeds to increase the size. The Cleveland Bay, I think, is absolutely useless. Out here he seems to lose all character, and being a long, loose built animal, his faults are intensified in his stock. Of the heavy breeds, I think the Suffolk Punch stands our climate and veld best, and mares by him would, if put to a thoroughbred sire be quite heavy enough for artillery work. They would also be active and fast. The Arab is a very hardy, sound animal, and gets stock that will stand hunger and hardship to an extraordinary extent. He may be used with advantage, but one must naturally expect to get undersized ones by him. I should, however, like to see the result of a cross between a high-class Arab sire and a good English thoroughbred mare of a good size and high quality. The first sire of any importance that I can remember in the district was a dappled grey, called Damascus, the property of Mr. Van Zyl, of Hanglip. He was got by an imported Arab, Damascus, out of Lady of the Grove, an imported English thoroughbred mare. Brood mares by this horse made Mr. Van Zyl's reputation as a successful breeder of race-horses. I remember one old mare by Damascus called Wit Kous, who bred to Express a thoroughbred horse, the following winners:— Sir Reuben, Prince Alexis, Good Hope, and Rob Roy; also Bonnie Lassie (dam of Hard Cash and Prosecutor), and Hantam Belle to Champagne Charlie. These were all good winners, and could stay for ever. Good Hope, as a two year old, ran second to that good horse Dunbar in a big field for the Cradock Gold Cup, a two mile race. Rob Roy, I trained and when two years old ran him in the Philippolis Meeting, which, was one and a half mile heats. In the first of these he was beaten by a very speedy thoroughbred mare called Corisande. The next heat I told my jockey to tackle her from the start. The result was that the two year-old wore her down, and won comfortably. The third heat he had it all his own way though there were good stayers as well as speedy ones in the race. The four and a half miles that this two-year-old negotiated did not harm him in the least, and he went on

WINNING RACES

till he was seven years old. I also had Hantam Belle as a two-year-old, and ran her for the big race at Burghersdorp, which was two miles. She met a big field, and some of the best stayers in the country were competing. These she, however, had no difficulty in beating and overpowering. Her light jockey distanced her field with the exception of one five-year old who just saved his bacon. Bonnie Lassie never was trained, but to Champagne Charlie she bred that good horse Hard Cash, and Prosecutor to Sir Amyas Leigh, two horses that could both stay and go with the best. Mares by Damascus bred numerous other winners, and I must say that I think a deal of their hardiness and staying qualities were inherited from the Arab strain, as both Express and Champagne Charlie were bred from speedy rather than staying families. As I said before, the only objection to the Arab is his size, but a colt by one out of a good big English thoroughbred mare would probably get stock such as Damascus did, and these as brood mares would be invaluable. I, however, look upon the thoroughbred as an improved Arab, and am convinced that for breeding horses for fast work he cannot be beaten Of course, I am referring to the big boned, short-legged, sound thoroughbred.

OUR MEAT SUPPLY.

By P. J. du TOIT (Department of Agriculture)

The following Return has been prepared from information supplied by Magistrates and from Census Reports

District.	Total Urban Population.	Percent of Coloured Urban Population	Beef, Mutton, and Pork bought monthly by Urban Population: Colonial (lbs)	Foreign fresh, chilled or frozen (lbs)	Total Quantity lbs	Price per lb: Lowest	Highest	Monthly consumption *per capita* of Urban Population (lbs)	Remarks
						d	s. d		
Aberdeen ..	2,553	36 43	25 000	..	25,000	7½	9	9 79	
Albany .. .	15 160	48 48	110 489	6,373	116,862	6	1 2	9 67	
**Albert*	4,206	54 42	23,200		23,200	9	10	5 51	Considerable quantity of meat purchased on local market by residents
Alexandria ..	632	41 93	9,600	..	9,600	9	10	15 19	Butchers sell also to farmers in the neighbourhood of the town.
Aliwal North .	7,683	62 70	54,968	85	55,053	7	1 0	7 16	
**Barkly East*	1,609	40 15	6,900	.	6,900	6	9½	4 35	Majority of residents slaughter for themselves
**Barkly West* ..	2,171	81 37	..	..	..	3	1 0	..	Particulars of meat consumed not obtainable.
Bathurst ..	1 598	57 01	5,950	..	5,950	4	1 0	3 72	Residents live chiefly on poultry and mealies. Bathurst village has been excluded, there being no butcher
Beaufort West ..	5 478	59 69	20,000	50 000	70,000	6	1 0	12·77	Meat also sold to railway employes along the line, and to refreshment rooms at Beaufort West and De Aar.
**Bedford* .	2 257	66 90	8,170	.	8,170	7	1 0	3 61	Many residents purchase direct from farmers.
Bredasdorp	1 138	52 17	15,733		15,733	..	8	3 90	Elim Mission Station, which is properly speaking Urban, has been included
Britstown .	4 912	61 31	19 800	11,250	31,050	9	10	6 28	

DISTRICT.	Total Urban Population.	Percent. of Coloured Urban Population.	Beef, Mutton, and Pork bought monthly by Urban Population			Price, per lb.		Monthly consumption *per capita* of Urban Population (lbs.)	REMARKS.
			Colonial (lbs.)	Foreign (lbs.)	Total Quantity (lbs.)	Lowest.	Highest.		
						d.	s. d.		
Caledon ..	3,508	41·31	19,465	2,925	22,390	6	10	6·38	
Calvinia ..	1,619	67·89	15,950	..	15,950	..	6	9·91	Exclusive of Brandvlei, where there is no butcher.
Cape	183,873	38·76	464,347	1,962,203	2,426,550	4	1 2	13·14	
Carnarvon ..	1,863	67·10	11,230	..	11,230	6	7	6·02	
†*Cathcart* ..	1,714	54·43	15,717	..	15,717	7	10	9·16	Meat supplied also to some rural inhabitants.
Ceres	3,063	58·61	15,958	3,546	19,504	..	9	6·36	
†*Clanwilliam* ..	1,104	76·09	24,200	..	24,200	6	8	21·92	Large number of travellers also supplied for the road
Colesberg ..	2,668	63·49	21,005	..	21,005	8	10	7·87	
Cradock ..	8,473	58·80	60,764	..	60,764	6	1 1	7·17	
East London ..	30,188	43·05	186,119	103,258	289,377	6	1 3	9·58	
Fort Beaufort ..	3,100	54·33	27,280	..	27,280	6	11	8·80	Exclusive of Blinkwater, where there is no butcher.
Fraserburg ..	1,217	62·94	9,000	..	9,000	6	7	7·39	
**George*	4,665	51·99	14,130	..	14,130	6	9	3·02	Majority of residents buy in local market once a week. Pacaltsdorp has been excluded, there being no butcher.
†*Glen Grey* ..	653	59·72	6,000	..	6,000	8	9	9·18	Butchers supply also a large number of rural inhabitants.
**Gordonia* ..	3,401	74·68	2,100	..	2,100	..	6	·61	Majority of residents slaughter for themselves.
Graaff-Reinet ..	11,595	57·95	77,000	..	77,000	4	10	6·64	
Hanover ..	1,232	47·73	10,826	..	10,826	8	9½	8·78	
**Hay*	1,556	60·86	9,506	..	9,506	8	10	6·10	A number of residents slaughter for themselves.
**Herbert*	1,655	53·90	..	..	..	8	1 0	..	Particulars of meat consumed not obtainable.
**Hope Town* ..	2,129	55·90	7,205	..	7,205	8	1 0	3·43	Large number of residents slaughter for themselves.
Humansdorp ..	2,472	74·60	9,450	..	9,450	5	11	3·82	On further inquiry, the figures were reported to be correct.
Jansenville ..	1,247	59·66	13,500	..	13,500	7	10	10·82	Meat and bread form staple diet of many.
Kenhardt ..	782	76·85	6,220	..	6,220	6	8	7·95	
Kimberley ..	46,231	61·80	228,941	216,396	445,337	4	1 3	9·63	

District.	Total Urban Population	Percent. of Coloured Urban Population.	Beef, Mutton, and Pork bought monthly by Urban Population.			Price per lb.			Monthly consumption *per capita* of Urban Population (lbs.)	Remarks.
			Colonial (lbs.	Foreign (lbs.)	Total Quantity (lbs.)	Lowest.	Highest.			
						d.	s.	d.		
†*Kingwilliamstown*	12,619	46·18	117,560	9,000	126,560	9	1	0	10·02	Exclusive of Mnxesha, Pirie, Peelton, Frankfort, and Braunschweig, where there are no butchers. Butchers sell also to some of rural population.
Knysna ..	1,775	43·83	7,450	3,200	10,650	9		10	6 00	
†*Komgha* ..	683	49·05	6,420	1,225	7,645	8	1	0	11·19	Sales to contractors on railway included.
Ladismith ..	1,511	38·19	15,875	..	15,875	..		7	10 50	
Mafeking ..	5,588	75·11	28,800	160	28,960	4		10	5·18	Residents of Montsioa's Stad, who purchase from Mafeking butchers, have been included.
Malmesbury ..	7,671	43·46	58,845	6,350	65,195	8		9	8·49	
Middelburg ..	12,347	41·69	43,500	102,200	145,700	3		9	11·81	101,000 lbs. supplied monthly to Military.
Molteno ..	2,725	60·66	23,800	..	23,800	8		11	8·73	
Mossel Bay ..	4,646	62·12	20,900	9,000	29,900	8		9	6·43	
**Murraysburg* ..	1,271	43·90	5,840	..	5,840	..		9	4·59	Majority of residents purchase on morning market
Namaqualand ..	4,444	85·98	27,000	..	27,000	7		9	6·07	
Oudtshoorn ..	9,848	54 04	69,734	..	69,734	5		10	7·09	
Paarl	17,479	53·71	64,353	89,701	154,054	5		10	8·81	
Peddie	1,130	62·04	7,300	..	7,300	8		11	6·46	
**Philipstown* ..	2,409	43·50	11,765	..	11,765	..		10	4·88	Most residents slaughter for themselves.
Piquetberg ..	2,462	49·92	15,100	..	15,100	6		9	6·13	
Port Elizabeth ..	42,731	45·70	510,942	34,000	544,942	8	1	4	12·75	
†*Prieska* ..	1,319	55·50	12,480	..	12,480	8	1	0	9·16	Butchers sell also to transport riders.
Prince Albert ..	3,043	45·87	32,815	..	32,815	6		8	10 78	
Queenstown ..	11,754	55·24	71,468	32,300	103,768	4	1	4	8.82	
**Richmond* ..	2,001	58·77	9,300	..	9,300	6		8	4 64	Majority of residents slaughter for themselves.
Riversdale ..	2,904	54·00	21,765	..	21,765	6		8	7.49	
†*Robertson* ..	6,338	12·58	80,406	10,000	90,406	4		9	14·26	Butchers sell considerable quantity to farmers.
Somerset East ..	6,329	64·44	56,190	..	56,190	6		11	8·87	
Stellenbosch ..	11 091	48·61	51,473	79,846	131,319	6		11	11·84	Large number of boarding houses in district supplying non-residents.
Steynsburg ..	2,250	42·71	22,000	..	22,000	7		9	9·77	

DISTRICT.	Total Urban Population.	Percent. of Coloured Urban Population.	Beef, Mutton, and Pork bought monthly by Urban Population. Colonial (lbs.)	Foreign (lbs.)	Total Quantity (lbs.)	Price per lb. Lowest.	Highest.		Monthly consumption *per capita* of Urban Population (lbs.)	REMARKS.
						d.	s.	d.		
†*Stockenstrom* ..	494	64.37	6,142	..	6,142	9		10	12·43	Butchers sell also to rural inhabitants near the town.
Stutterheim ..	1,220	46·23	.13,000	..	13,000	8		10	10·65	Exclusive of Wartburg and Emgwali, where there are no butchers.
Sutherland ..	474	43·67	4,720	..	4,720	6		7	9·95	
Swellendam ..	5,743	60·77	32,582	1,200	33,782	6		9	5.88	Exclusive of Malagas, where there is no butcher
Tarka	2,270	53·62	10,000	2,400	12,400	7		9	5·46	
Tulbagh ..	3,453	76·37	14,020	7,041	21,061	6		8	6·09	
Uitenhage ..	12,738	47·52	79,180	5,500	84,680	6		11	6·64	
Uniondale ..	2,095	71·71	9,900	..	9,900	6		8	4·72	Vegetables and fruit are cheap. Poorer classes eat very little meat.
Van Rhynsdorp ..	588	48·98	4,000	..	4,000	..		7	6·80	
Victoria East ..	1,216	41·12	9,400	600	10,000	10	1	0	8·22	Exclusive of Lovedale, where the Institution slaughters for the inmates.
Victoria West ..	3,219	53·00	23,860	..	23,860	7		9	7·41	
Vryburg ..	7,560	81·90	41,530	385	41,915	8	1	3	5·54	
Willowmore ..	3,042	59·04	19,794	..	19,794	7		8	6·50	
Wodehouse ..	4,660	64·06	29,000	2,800	31,800	5		10	6·82	
Worcester ..	8,088	54·16	31,110	41,580	72,690	7		8	8·98	
Maclear ..	765	53·07	5,955	..	5,955	8		10½	7·78	
†*Matatiele* ..	865	58·50	11,500	..	11,500	8		9	13·29	Butchers sell also to rural inhabitants.
Mount Ayliff ..	232	59·05	1,700	..	1,700	9	1	0	7·32	
Mount Currie ..	2,903	71·13	21,724	..	21,724	6		10	7·48	
†*Mount Fletcher* ..	150	62·66	2,150	..	2,150	8		10	14·33	Butchers sell also to rural inhabitants.
Qumbu ..	217	51·15	3,000	..	3,000	7		8	13·82	On further inquiry the figures were reported to be correct.
Tsolo	241	58·92	1,675	..	1,675	9	1	0	6·95	
†*Umzimkulu* ..	737	88·47	7,600	..	7,600	9		10	10·31	Butchers sell also to rural inhabitants.
Elliot ..	902	47·34	7,400	..	7,400	8		9	8·20	
Engcobo ..	2,070	92·90	10,230	..	10,230	7		8	4·94	

DISTRICT.	Total Urban Population.	Percent. of Coloured Urban Population.	Beef, Mutton, and Pork bought monthly by Urban Population.			Price per lb.		Monthly consumption *per capita* of Urban Population (lbs.	REMARKS.
			Colonial (lbs.)	Foreign (lbs.)	Total Quantity (lbs.)	Lowest.	Highest. s. d.		
Umtata ..	2,342	52·78	25,400	..	25,400	5	1 1½	10.84	
Xalanga ..	1,441	49·30	8,950	..	8,950	8½	10½	6·21	
Butterworth ..	5C4	30·67	8,460	..	8,460	7½	10½	15·00	Large quantity of meat consumed by travellers passing through.
Idutywa ..	458	57·64	8,430	..	8,430	6	9½	18·40	Butchers sell also to travelling public, who, compared with the number of residents, form a large proportion of the consumers.
†*Kentani* ..	101	49·51	1,600	..	1,600	9	1 0	15·84	Butchers sell also to rural inhabitants.
Nqamakwe ..	90	37·78	..	..	..	..	..	..	There being no butchers in Nqamakwe, this district has been treated as purely rural.
Ngqeleni ..	161	74·54	675	..	675	7½	10	4·19	
Port St. John's ..	407	55·53	2,200	..	2,200	11	1 1	5·40	
†*Tabankulu* ..	246	74·80	2,000	..	2,000	..	8	8·13	Butchers sell also to rural inhabitants.

NOTE.—Some small urban localities have no butcher, and the inhabitants thereof who do not raise their own stock buy from farmers and others. These localities have been excluded from the return. On the other hand, there are some urban residents who raise their own meat, in localities where there are butchers, and the quantity consumed by such residents has been included in the return. Data are not available for excluding the second class and for including, from among the first-named class, those who buy from farmers and others. The number in each case is, however, so small as to be negligible.

Wherever Colonial meat is mentioned in this article the term must be taken to mean mutton, beef and pork.

An examination of the detailed return indicates appreciable differences in the rate of consumption. It is therefore necessary to analyse the figures; for it is evident that, unless the returns can be accepted as reliable, any deduction from them can have little or no value.

In this connection it must be borne in mind that:—

(1) The purchasing power of the coloured population is much smaller than that of the white population; and the larger the coloured population, the smaller the amount of meat consumed *per capita,* other things equal; and *vice versa.*

(2) Natives eat very little meat; and the larger the purely native population, the smaller the amount of meat consumed *per capita* other things equal; and *vice versa.*

(3) The lower the price of meat, the larger the quantity consumed, other things equal; and *vice versa.*

(4) Foreign meat is cheaper than Colonial meat.

(5) When meat is dear in two given areas and vegetables are plentiful in one and scarce in the other, less meat will be consumed in the area in which vegetables are plentiful than in the one in which they are scarce, other things equal.

In comparing different districts, with a view to establishing the correctness or otherwise of the returns furnished, it is impossible, to apply with minute accuracy any one of the axioms in regard to any two areas, for other circumstances will never be found equal in such areas; but there are districts whose conditions for the purpose of this article are more or less the same; and we may therefore compare them as far as possible.

CALVINIA, CARNARVON AND FRASERBURG.

	Uurban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Calvinia ...	1,619	67·89	6d.	9·91 lbs.
Carnarvon ...	1,863	67·10	6d.—7d.	6·02 „
Fraserburg ...	1,217	62·94	6d.—7d.	7·39 „

As to Calvinia and Fraserburg, the larger consumption *per cap.* in Calvinia is probably explicable on the ground that meat is cheaper there than in Fraserburg and that, although the percentage of coloured inhabitants is a little larger in Calvinia, Fraserburg has a purely native urban population of 18·67 per cent. as against 7·42 per cent. in Calvinia. Again, comparing Calvinia and Carnarvon, the same reasons would seem to apply, but with greater force, seeing that there is in Carnarvon a purely native urban population of 27·16 per cent. as against 7·42 per cent. in Calvinia.

OUDTSHOORN AND PRINCE ALBERT.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Oudtshoorn ...	9,848	54·04	5d.—10d.	7·09 lbs.
Prince Albert ...	3,043	45·87	6d.— 8d.	10·78 „

Two causes operate in favour of the larger consumption in Prince Albert: a smaller coloured population and a lower price of meat. There is also the additional factor that Prince Albert has a purely Native urban population of 7·52 per cent. as against 14·61 per cent. in Oudtshoorn.

RIVERSDALE AND LADISMITH.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Riversdale ...	2,904	54·00	6d.—8d.	7·49 lbs.
Ladismith ...	1,511	38·19	7d.	10·50 „

The difference in consumption seems to be inferable from the difference in the percentage of coloured urban population. On the other hand Ladismith has a larger purely Native population, viz.: 12·71 per cent. as against 4·07 per cent.

ABERDEEN AND JANSENVILLE.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Aberdeen ...	2,553	36·43	7½d.—9d.	9·79 lbs.
Jansenville ...	1,247	59·66	7d.—10d.	10·82 „

Here one would expect, owing to the relatively larger coloured population—and the difference is more marked as regards the purely Native population of the two towns—that the consumption of meat in Jansenville would be lower than in Aberdeen. The only likely explanation of the inversion of the usual order seems to be, according to the Magistrate, that meat and bread form the staple diet of many of the Jansenville inhabitants.

GRAAFF-REINET AND SOMERSET EAST.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Graaff-Reinet ...	11,595	57·95	4d.—10d.	6·64 lbs.
Somerset East ...	6,329	64·44	6d.—11d.	8·87 „

There, too, one would, on the face of things, expect a relatively larger consumption in Graaff-Reinet. Probably the exceptional fertility of Graaff-Reinet accounts for the small quantity of meat consumed; a factor which appears to explain to some extent also the small consumption of meat in Uitenhage, viz.: 6·64 lbs. per head.

MALMESBURY AND PAARL.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Malmesbury ...	7,671	43·46	8d.—9d.	8·49 lbs.
Paarl ...	17,479	53·71	5d.—10d.	8·81 „

In these two districts the consumption *per cap.* is nearly the same. While in Malmesbury, where comparatively little imported meat is sold, meat is dearer, the Paarl has a larger coloured population.

CAPE, EAST LONDON AND PORT ELIZABETH.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Cape ...	183,873	38·76	4d.—1/2	13·14 lbs.
East London ...	30,188	43·05	6d.—1/3	9·58 „
Port Elizabeth ...	42,731	45·70	8d.—1/4	12·75 „

Three things are prominent as regards the sea-port towns: the relatively high rate of consumption, pointing, probably, to greater purchasing power of the sea-port communities; the small quantity of foreign meat consumed in Port Elizabeth compared to Cape Town and East London; the much smaller rate of consumption in East London compared to the other two towns. As to the last point, three villages, where the rate of consumption is very low, are included, but for which the rate of consumption in East London would be 1 lb. per head more.

MOLTENO AND STEYNSBURG.

	Urban Population	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Molteno ...	2,725	60·66	8d.—11d.	8·73 lbs.
Steynsburg ...	2,250	42·71	7d.—9d.	9·77 „

These figures are all in favour of a larger consumption per head in Steynsburg.

CARNARVON AND KENHARDT.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Carnarvon ...	1,863	67·10	6d.—7d.	6·02 lbs.
Kenhardt ...	782	76 85	6d.—8d.	7·95 „

Here it would seem that, on account of its larger coloured population, and the higher price of meat, the rate of consumption in Kenhardt should be less than in Carnarvon. The purely native population of Kenhardt is, however, smaller than that of Carnarvon by 8½ per cent. The probability is that, owing to the longer distance from the railway line and the consequent higher cost of transport, the residents of Kenhardt consume less other foodstuffs, and, therefore, more meat, than do the inhabitants of Carnarvon.

Knysna and Mossel Bay.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Knysna ...	1,775	43·83	9d.—10d.	6·00 lbs.
Mossel Bay ...	4,646	62·12	8d.—9d.	6·43 „

Knysna has a smaller percentage of coloured population; but in Mossel Bay meat is cheaper. The purely native population is in each case under two per cent.

Molteno and Queenstown.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Molteno ...	2,725	60·66	8d.—11d.	8·73 lbs.
Queenstown ...	11,754	55·24	4d.—1/4	8·82 „

There is a larger white population in Queenstown; on the other hand Molteno has a purely native population of 56·76 per cent. and Queenstown of 49·95 per cent. Again, the meat which the white population would consume appears to be dearer in Queenstown than in Molteno.

Mafeking and Vryburg.

	Urban Population.	Per cent. of Coloured Population.	Price of Meat.	Consumption *per cap.*
Mafeking ...	5,588	75·11	4d.—10d.	5·18 lbs.
Vryburg ...	7,560	81·90	8d.—1/3	5·54 „

Vryburg has a larger purely coloured population; and the price of meat is higher there than in Mafeking, but this is more apparent than real, because the high price is that obtained at Kuruman (included in Vryburg), where a small quantity of meat is consumed. The purely native population of Mafeking (including Montsioa's Stad) is 74·93 per cent. and that of Vryburg 73·88 per cent.

If the Districts of the Transkeian Territories be compared, it will be found that no exception can be taken to the returns furnished, except that for Qumbu, the correctness of which seems doubtful. The only other return that requires comment is that for Umtata. This village, which is the capital of Tembuland and the seat of Chief Magistracy, has probably to provide for a fair number of travellers.

In these comparisons neighbouring districts have been taken as far as possible as more likely to have more or less similar conditions. In the case of distant districts the comparisons would sometimes be found not to bear out the axioms; *e.g.*, in comparing Caledon with Malmesbury, where one would expect to have more or less an equal rate of consumption. In view, however, of the fact that on further inquiry the figures were affirmed to be correct, some cause not easily apparent must operate against Caledon. So with regard to Steynsburg and Tarka. The latter has a larger purely native population and the former, by means of the railway refreshment room, supplies a number of people passing by rail. Still one would expect the difference in favour of Steynsburg to be less than it is.

On the whole, however, there seems to be good reason for accepting the figures as approximately correct.

It will be seen that in some of the districts italicised (marked *) either an unknown number of the urban population slaughter stock bought by themselves, or figures of consumption are not obtainable; and that in the remainder of the districts italicised (marked †) an unknown number of the rural population are served by the local butchers. In the latter group of districts the quantity of meat consumed by the rural population, who will probably continue to be supplied by butchers, will, for the purpose of calculating the quantity of meat consumed by those who do not rear stock themselves, have to be included. In the former group we can only approximately arrive at the quantity of meat consumed, by assuming that the rate of consumption in those centres is the average for the districts not italicised.

In the districts not italicised the urban population number 565,400 and they consume monthly 5,425,799 lbs. of beef, mutton and pork, equal to 9·59 lbs per head.

In the italicised districts marked * the urban population number 29,306, who would consume, supposing they consumed at the above average rate, 29,306 × 9·59 lbs., or 281,045 lbs. monthly.

In the italicised districts marked † the quantity of meat sold monthly by the butchers is 323,600 lbs.

The quantity of meat, exclusive of imported preserved (tinned) and salted or cured (not tinned) meat consumed monthly by the urban population and a very small number of the rural inhabitants is therefore :—

For the Districts not italicised ...	5,425,799 lbs.
„ marked * ...	281,045 „
„ marked † ...	323,600 „
	6,030,444 lbs.

of which 2,794, 524 lbs is imported, (frozen, chilled or fresh) meat and 3,235,920 lbs. is Colonial meat.

To the Colonial meat and the imported frozen chilled or fresh meat consumed, must be added a quantity of imported preserved (tinned) and salted or cured (not tinned) meat. Practically the whole of the imported preserved and salted or cured meat consumed in this Colony would be consumed by the urban population. We have no means of knowing how much of such imported meat is retained for consumption in this Colony and how much is consumed in the new colonies, in Rhodesia, Basutoland, &c. Since 1898 the following quantities of meat have been imported.

Year.	Frozen, chilled or fresh.*	Preserved (tinned) and Salted or Cured (not tinned).
1898	1,964,757	6,377,289
1899	9,554,458	8,913,379
1900	37,662,745	10,277,159
1901	42,999,482	10,745,897
1902	84,500,360	20,417,625
1903	79,144,045	15,098,914
1904	54,327,533	7,653,949

* A small quantity of game and poultry included.

Of the 54,327,533 lbs. of frozen meat imported in 1904 it would appear from the detailed return that approximately 33,534,288 lbs was retained for consumption in the Colony. If the proportion of imported preserved and salted or cured meat retained for consumption is the same (which may be a quite erroneous hypothesis), then of the 7,653,949 lbs. of such meat imported last year, about 4,723,000 lbs. remained in this Colony. Unfortunately owing to the war and to drought the years from 1900 to 1903 were abnormal; moreover the quantity of preserved meat disposed of by the Military authorities shortly after the war must also largely have affected the importation, at least in 1903, of preserved meat. It is therefore impossible to arrive approximately at the quantity of imported preserved and salted or cured meat consumed in this Colony under normal circumstances. It seems quite safe, however, to take it at not more than 1,000,000 lbs. per month. If so, *the total monthly consumption by the urban population and a very small number of the rural inhabitants*

Imported frozen meat ...	2,794,524	3,794,524 lbs.
Imported preserved and salted or cured meat ...	1,000,000	
Colonial Meat		3,235,920 lbs.
Total		7,030,444 lbs.

It now remains to calculate the total quantity of Colonial meat available for consumption by the urban population, without diminishing the supply, that is, without disposing of breeding stock. We shall then be able to see whether we have sufficient stock to supply ourselves with meat.

To make this calculation various factors have to be taken into consideration, such as the percentage of ewes to wethers and rams, the percentage of ewes that would lamb, the percentage of lambs that would be reared, loss from disease and from vermin. Similarly as regards the rate of increase of goats and of cattle. A greater factor in our meat supply than any other is, of course, drought; but, having now passed through several years of it, and guided by past experience, there is justification for believing that we have arrived at the end of it. Indeed, it is impossible to form any satisfactory conclusion as to meat supply if abnormal factors have to be considered. We must therefore base our calculations on figures for *ordinary seasons.*

At the taking of the last Census there were in the Colony:—

Sheep and Goats	18,981,292
Cattle	1,954,390

Now, *in ordinary seasons,* it is considered by local farmers of standing that—

In Elliot district about 80 per cent. of the ewes lamb and about 75 per cent. of the lambs are reared; in other words, for every 100 ewes 60 lambs would be reared.

In Maclear district, with its coarser, "untamed" grass, about 80 per cent. of the ewes lamb and 65 per cent. of the lambs are reared; in other words, for every 100 ewes 50 lambs would be reared.

In Barkly East, for every 100 ewes about 75 lambs would be reared.

In Stutterheim, for every 100 ewes about 70 lambs would be reared.

In Queenstown, for every 100 ewes about 70 lambs would be reared.

In Hope Town, for every 100 ewes about 80 lambs would be reared.

In Calvinia, for every 100 ewes about 85 lambs would be reared.

In some districts where much loss from disease is suffered, *e.g.*, Hay and Herbert, the percentage is probably less than 50.

We have no statistics as regards the percentage of kids that would be dropped and reared; but a Cape goat drops, as a rule, two kids at a time, sometimes even four; and an Angora goat sometimes one and sometimes two.

Goats are consumed chiefly by the farming population and their servants; but a fair number are disposed of for urban consumption; indeed, a Cape goat fetches, as a rule, a higher price than a sheep, on account of its greater weight. Again, though goat flesh is eaten in urban centres to a small extent only as compared with mutton, the large consumption by the rural population of goat flesh largely increases the number of sheep for sale. We may therefore, for present purposes, lump sheep and goats (speaking of both as sheep).

In calculating the quantity of Colonial meat available for consumption by the urban population, that is, *the quantity for sale by the rural population,* it must be borne in mind that, while in some districts the number of lambs reared in ordinary seasons is small, in other districts, like Calvinia, Kenhardt, Fraserburg, &c., the farmers have, except in drought, three lambings in two years. I think, therefore, that an average of 60 lambs reared to every 100 ewes is not too high; in fact, considering that there are 7,162,463 goats in the Colony to 11,818,829 sheep, I think this average is too low.

The number of ewes is usually reckoned at about half—rather more than half—the number of sheep. After the war a fairly large number of breeding stock were exported to the new colonies; and I think it would be near the truth if the number of ewes in the Colony be taken at rather less than half the total number of small stock—say, at 9,000,000. On the basis of 60 lambs reared from every 100 ewes, we have therefore 5,400,000 lambs reared in an ordinary year.

Of the lambs, the proportion of ewes to the total member is also about half. Those reared are kept for breeding purposes; while the wethers reared are available for consumption. The tendency of the farmer, naturally, is towards increasing his flock; but in doing so he has to take into account the capacity of his farm. He cannot, therefore, indefinitely increase his flock. To enter, however, into the question of how many he *must* sell not to overstock, is to discuss the capacity of the whole of the stock runs—a matter on which we have not only no data, but which, for present purposes it is not necessary to raise. Let it be assumed (to err on the right side, if we err at all) that of the number of older wethers and old ewes,—which would far exceed half the total number of sheep,—the farmer has for sale, after supplying his own (including his servants') requirements—which vary as a rule from 1 to 3 sheep a week——no more than a number corresponding to the young wethers reared, namely, about 2,650,000 sheep (rams for breeding purposes having been excluded). From these must be deducted the number of sheep exported overland. The value last year, was £133,389, representing at present prices, say, 125,000,—a number which, as the new Colonies recover from the effects of the war, will be wiped out. There would therefore be for sale 2,525,000. Taking these at an average weight of 40 lbs., which appears to be generally regarded as a fair average—butchers put the present average at 42 lbs.,—there would be available for urban consumption 101,000,000 lbs. of mutton in an ordinary year.

Now with regard to the supply of beef. At the taking of the last census there were 1,954,390 head of cattle in the Colony. It is reckoned that the number available yearly *for sale*, after allowing for deaths from endemic diseases, &c., is rather less than one-sixth of the total number; so that, approximately 300,000 head would be for sale in a year. (According to the last census, returns, to be shortly issued, 30,554 head of cattle died of disease, &c., during the year ended, 31st March, 1904). Deducting 19,300 head exported oversea and overland last year—a trade which is probably temporary, however—280,700 head would be available for urban consumption. The average weight of Cape slaughter cattle has been given by butchers as about 500 lbs. (clean weight of course).

The rural population, *after supplying their own needs,* would therefore be able to supply the urban population, with,—

Mutton	101,000,000 lbs.
Beef	140,350,000 „
Total for a year ...	241,350,000 lbs.
Total, monthly ...	20,112,500 „

In addition to the supply of beef and mutton, there is a large quantity of pork available for consumption; but we have no data for calculating what that quantity is. At the last Census-taking there were 385,945 pigs in the Colony.

SUMMARY.

Monthly consumption by the urban population and a very smal number of the rural population.—

Colonial meat	3,235,920 lbs
Imported meat (frozen chilled or fresh)	2,794,524 „
Imported meat (preserved in tins, and salted or cured)	1,000,000 „
	7,030,444 lbs.

Monthly supply of Colonial meat for consumption by the urban population.

Mutton	8,416,667 lbs.
Beef	11,695,833 „
	20,112,500 lbs.

And an unknown quantity of pork.

RUST IN WHEAT.

The all important problem of combatting rust in wheat is being energetically tackled by Mr. Robert Starke, of Oatlands, Durbanville, who exhibited at Rosebank twelve samples of wheat with which he has been experimenting during the past season.

The seed was obtained from various parts of the world, the three "Elephant" and the two "Dame" types referred to having been produced by artificial cross-fertilisation by Professor Wohltmann of Bonn, Germany, specially with a view of obtaining rust resistant wheats, while in Australia, Mr. Farrar produced the variety bearing his name with the same object. Red Egyptian and Rietti were both introduced some time ago by the Agricultural Department; the former is still occasionally met with, while the latter in spite of several undesirable qualities is the only variety which can be confidently recommended, and is now rapidly displacing other kinds throughout the wheat growing areas. They formed part of the experiment for the purposes of comparison.

The remaining sorts Mr. Starke obtained through the kindness of Messrs. D. Mills & Sons. Cape Town.

The experiments must be continued for several seasons before any final conclusion can be arrived at, while such varieties as have succumbed need not be further tested.

The public will watch the progress of Mr. Starke's efforts with the keenest interest and with earnest hopes for their success.

The following is his first report sent to the Agricultural Assistant, Department of Agriculture:—

I beg to submit my report on a few samples of Wheat supplied by the Department of Agriculture and Messrs. D. Mills & Sons.

ELEPHANT.—The three kinds of Elephant Wheats sown, gave a good return in Grain, strong growth in Straw of over six feet in height. The grain to all appearances is a good milling one, and was free from rust.

NICARAGUA.—Wheat took rust in the Straw badly, the Grain also being seriously damaged. This Wheat I do not intend sowing again.

BLAUE DAME AND GRUNE DAME.—Blaue Dame and Grune Dame Wheats were very badly attacked by rust and were sown between plots of Elephant which were free from rust, the grain too was very poor and I do not consider these worth trying again.

RED EGYPTIAN.—Red Egyptian Wheat took rust badly in Straw, Grain fairly free from damage by rust, but I do not consider this Wheat a suitable one for the Koeberg district.

RIETTI.—Rietti Wheat, as usual, was free from rust, and it is only to be regretted that this Wheat is so liable to shell out before it is ripe; the milling quality of this Wheat too is not as good as one would wish.

DARLING WHEAT.—Samples of Darling Wheat supplied by Messrs. D. Mills & Sons, Cape Town, entirely free from rust and I consider this a grand Wheat for sowing anywhere in our Districts and will be pleased to report again on it next season.

CARVEAL.—Carveal Wheat very good too, and I am of opinion that it will run Darling Wheat fairly close.

FIELD.—Field Wheat attacked by rust, bad in Straw, and Grain inferior.

FARRAR.—Farrar Wheat, very slightly attacked by rust, but not a good growing Wheat and ears very small.

In addition to the above the Department has recently received reports from various parts of the Colony on certain of these varieties distributed for experimental sowing.

Red Egyptian wheat which took rust in the stem and leaf in the Koeberg, gave much better results in the Eastern Province as the following reports show. Mr. Bowen, manager for Mr. Daverin, Springvale, Alexandria, writes "Red Egyptian did awfully well until it was almost full in ear and looked very healthy, but dry weather set in and it got burnt. It was sown too thick for our district and too late. If sown in June or July with fair rains I think it would do well." Mr. P. Cairns, Monzie, East London, reported after a very dry season and a visitation by locusts "I think it very good for this district, if I get rain soon, I will try it again. No rust."

Mr. E. W. Holdstock Christmas Vale, East London, says:—"Wheat that I received from the Department three years ago as Red Egyptain has now been sown three seasons without showing any signs of rust. Two bags sown this year have only given the return of the seed owing to locusts, drought and small birds. A favourable report also came from the Humansdorp district all being from sandy soils and all have suffered on account of the dry season.

Nicaragua wheat which took rust badly in Mr. Starke's experiments, and also at Springvale, Alexandria, is favourably reported on by Mr. S. R. Nash, Thomas River, Cathcart, but in very dry weather when rust would not likely be prevalent.

Other experiments particularly in the Eastern Province proved failures on account of the drought and locusts, and many disappointments had to be faced on this account.

A supply of New Era—an English hybrid claiming to possess rust resistant properties was kindly placed at the disposal of the Department by Mr. R. Crombach of Cape Town, but owing to the seed having been damaged in transit no reliable reports were obtained.

A fresh supply has however been distributed, and it is trusted that more definite results may be obtained next season.

SEEDS FOR DISTRIBUTION.

With further reference to the articles appearing in the August, September, and October numbers of the *Agricultural Journal* in connection with Seeds for experimental purposes, we have been requested to announce that supplementary supplies of the undermentioned varieties of Seeds have now come to hand, and are available for distribution in experimental quantities:—

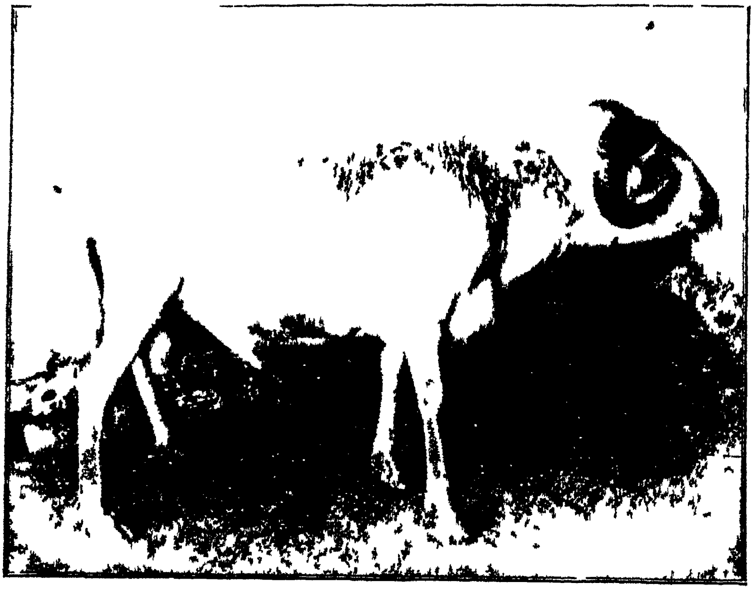
Standard Red Wheat; White Clover; Giant White Clover; Alsyke Clover; Red Clover; Poa pratensis (Meadow Grass); Buckwheat; Winter Vetches; Spring Vetches; Italian Rye Grass; Perennial Rye Grass; Cocksfoot Grass; Timothy Grass; Winter Rape; Summer Rape; Early Red Trifolium; Giant Sainfoin (milled); Common Sainfoin (milled); Durum Wheat.

Farmers desirous of making trials of any or all of these seeds, and who are willing to supply reports on the results of their experiments with the same, should apply direct to Dr. Eric A. Nobbs, Agricultural Assistant, Department of Agriculture, Cape Town.

With regard to reports on the results of the trials, it may be mentioned that, after the lapse of a reasonable time from the date of receipt of the seed, printed Report Forms will be sent to those concerned, which must be filled in, signed and posted to the address printed on the back of the Forms.

TYPICAL AFRIKANDER RAM.

The Afrikander Ram, which took the first prize at the Riversdale Show (photos of which are given herewith), is a very fine specimen of that hardy and prolific breed Anyone looking at him could not help being at once struck with his strong masculine character, specially shown by the unusual development at the top of the neck behind the pole This indicates not merely proficiency, but prepotency He was not in full condition either as may be observed from the side view



Riversdale's Champion —Side and Back Views of Afrikander Ram

SOUTH AFRICAN STUD BOOK.

The Cape Section of the S.A. Stud Book invites applications for membership, and is prepared to deal with proposals from members to register their Horses, Cattle, Sheep and Pigs, in the Manuscript Stud Book. Special provision is made through the Association's Auxiliary Stud Book for South African bred Stock having no pedigree. Members possessing pedigreed Stock are asked for certified copies of their pedigree certificates to enable the necessary measures being adopted to arrange for the entering of such Stock as are eligible. The Association charges *no* entrance fee. The annual subscription is only 21s. Registration fees are charged, but over ten entries receive a rebate, and over twenty entries a further rebate.

The objects of the Association are to furnish certificates to worthy animals, thereby shewing their excellence and purity, and also to give pedigree certificates to the best with the view of making such Stock a more valuable possession for their owners. To keep carefully-compiled records of such Stock with the aim:—*First.* Of forming a standard whereby to measure more accurately the advance made in the profit-producing powers of each animal, as well as its power to reproduce its kind, provided it is worthy, and to fix to each breed its best, most suitable, and profitable features. *Second.* To publish at regular intervals a Stud Book of pedigrees, as well as achievements (in show, the ring, and in other ways) of registered animals for general information, and in every way possible to promote and encourage the breeding *within* the country, of the purest and best, thereby giving greater impetus to producing here much of the class of Stock we have been bound to import at great expense. Rules supplied gratis. Members are entitled to the *Agricultural Journal* free.

For further information, apply to

C. G. Lee,
Organising Secretary,
P.O. Klippaat.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

Locust Destruction.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I noticed in the current *Agricultural Journal* "A Working System of Locust Destruction." I have tried various Dips, and found Quibell's and "Little's Fluid" very effective, but the difficulty I experienced was getting the water for mixing the dip to the spot where the locusts collected for the night. A few casks of water do not go very far where one has to deal with a large swarm, with spray pump and watering cans. This last I prefer, as it reaches those lying underneath. The spray pump does only the surface ones. Soap and water proved an utter failure, Fungus as well, owing, I think, to our climate being too dry.

Now, sir, my experience thus far has proved to me that the best way to get rid of the voetganger locust is to get all your farm boys, arm them with spades and shovels, and while the locusts are roosting for the night to tackle them after dark and very early in the morning before daybreak, smash them down in the scrubs while roosting, and cover each lot with earth—*battered well down*. Let three or four boys surround each lot and hit hard and fast, and cover at once, as stated. You will find very few escape, and those that do don't seem to leave the spot, many being wounded in the beating process, die, and birds devour the rest. I have by this process killed scores of swarms. A few spades and shovels get broken, but I have found this method by far the simplest, and certainly most effective. The early morning I found the best time, as they are partly dormant. All one needs for this is a lot of boys, spades and shovels and three or four lanterns to light up the spots, after locating them the evening before, but better still if you can drive them to soft soil and short scrub What this country wants is a Compulsory Locusts Destruction Act, which I hope will be introduced and passed this Session. It is little encouragement to a farmer destroying locusts when 95 per cent. allow them to go free or pass them on to his neighbour.—Yours &c.,

WALTER JAS. EDWARDS.

Graaff-Reinet, Feb. 28.

Scab in Sheep and its Eradication.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I see a letter in the January *Journal* by Mr. W. R. Southey on the above subject. I will follow his example and have my say. It would be a good thing if every farmer expressed his opinion through the *Journal*. The Government should then be able to legislate and rid the country of scab. I have not farmed sheep as long as

Mr. Southey, but still long enough to know what scab is and how to cure it. I cannot agree with Mr. Southey that imported dips are no good. I have found some of them good, and believe that they will all destroy scab. It all depends on the thoroughness with which the dipping is done. I have no experience with lime and sulphur, so cannot say anything about it. The greatest objections to its use are the different qualities of lime one gets and the boiling process I farmed sheep before I came to this part of the country and cured scab with two dippings of Cooper's, but I will recount my experience since I came to this country in the beginning of 1892. I bought some sheep almost immediately, and about four months after scab broke out. I had the sheep brought up about once a week, and hand-dressed them with Cooper's until I clipped them in the beginning of November, when I gave them one dipping in Cooper's. That was the last I saw of scab for about six or seven years, when my herd boy brought my sheep home one day and told me there was a scabby sheep amongst them. It was simply hard with scab. I thought it was some strange sheep, but on looking carefully at the brand I saw it was one of mine. It must have been away somewhere. Scab was in the neighbourhood at the time.

I dipped it carefully with Odam's and rubbed sulphur on the hard places. I placed it in a small paddock with one other sheep as a companion. I dressed it once after that, which effectively cured it. I did not dip the flock, but watched them carefully, but they did not break out, nor did the scabby sheep's companion get it.

I have always taken the precaution to dip any sheep which I brought on the place as soon as possible after their arrival, and used on those occasions Odam's, Quibell's and nicotine Dips.

In March, 1903, I again bought some sheep, but could not dip them at once, as I had to go away from home for a short time. When I got home again I found a lot of the sheep showing scab. I dipped them at once in nicotine dip—only once—and I have not had scab since. In the 13 years I have been here I have brought 12 lots of sheep on nine different occasions on the farm, so that I ran a fair amount of risk of getting it from outside. I agree with Mr. Southey that if every farmer did his duty, there would be no need for legislation or scab inspectors, but how are they to be compelled to do their duty? I think it is a mistake to give dips free or even at cost for an unlimited period. I would make the following suggestions:—

1. Allow dips to be bought at cost for two years. After that let those who still wish to keep scab pay for their dips and get it the best way they can.
2. Compel every farmer who cannot get his flocks clean within a given time to reduce his flock to 200 or 300 until he has learned how to keep them clean and kept them so for a period.
3. Allow each inspector a gang of natives to dip all the scabby sheep in the area, and charge the owner so much a head. If he cleans his area and keeps it so for a specified time, give him a substantial bonus. If his area is not clean, dismiss him and try someone else.
4. Confiscate all scabby sheep. Let the inspectors go round once a month to every farm and pick out every sheep showing scab, take them and clean them. Then the Government can sell them by public auction, and devote the proceeds toward the salary of the inspectors.

I think any of the above suggestions if adopted would have the desired effect.—Yours &c.

M.

East Griqualand, Feb. 25, 1905.

Mealies after Turnips.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I see Mr. John G. Laing complaining of the failure of mealies after a turnip crop. Whatever the cause may be, it is a recognised fact here in East Griqualand that you cannot grow a good crop of mealies on any land which had turnips on the previous year and yet good crops of mealies can be grown year after year on the same soil which never had turnips on. Several farmers are giving up growing turnips on that account. Any kind of oats will do all right on turnip land but whether that will bring it right again for mealies I cannot say.—Yours &c.

D. B. MENNE.

Middle Valley, East Griqualand, Feb. 24th, 1905.

The Working of Syphons.

To the Editor, AGRICULTURAL JOURNAL.

With reference to the inquiries from your correspondent "Persevere," Dwaal, the llowing information might perhaps be of use to him.

He states firstly that in an altitude of 4,500 feet, he considers a suction of 22 feet would be about the mark.

Well, theoretically, the atmospheric pressure at that level, namely 12·8 lbs. per square inch, might possibly sustain this column, but highly improbable in practice. Such perfect vacuum is not obtained in syphons, for reasons I will mention later. In such an altitude, the section, that is the distance from the absolute lowest level the water sinks to in the borehole, to the highest point of delivery pipe, will not likely draw satisfactorily if over 18 feet in the outside. Even then a perfect vacuum must be maintained to obtain good results.

I Question. The loss by friction of water in pipes, which is sometimes considerable, is measured in pounds pressure per square inch again converted into so many feet of head, in order to equalise the pressure lost in friction.

II Yes. fall must be increased. as length increases, so as to allow for friction.

III Rule:—$$\frac{\text{Gallons per minute}^2 \times \text{length in yards.}}{(3 \times \text{diameter of pipe inches})^5} = \text{Head of water in feet.}$$

IV and V.—The delivery of water should not diminish, if the length of suction always corresponds with the atmospheric pressure, the water supply being constant and a perfect vacuum maintained.

VI.—The most common trouble in maintaining the action of syphons is caused by the collection of air in the highest part. Unless means are taken to get rid of this air the action is always liable to sudden stoppages, especially when the water supply is at its ebb, when there is not only the greatest vacuum in the syphon, and hence the greatest tendency for air to be given off, but when there also is less vigorous action tending to carry the air down the delivery. As long as the velocity is great, the water will carry the air with it, more head will therefore give better action. The minutest leakage in the syphon is sure to cause stoppage by the drawing of air. This collection of air, which takes place always at the highest part, is got rid off by a water trap constructed on the pressure lubricator principle. Without entering into details of construction, the action of this trap displaces any air, which collects in the syphon, and therefore in case of minute leaks helps to overcome the effects of such. If requested, I will be pleased to give description of trap.

VII &c.—Air cannot possibly enter through the discharge end, if syphon is working, as water is by a long way heavier than air —Yours &c.

O. W. NICOLAYSON.

Cradock, Feb. 18.

"Jumper *vs.* Diamond Drills."

To the Editor, AGRICULTURAL JOURNAL.

SIR,—With regard to "Persevere's" query about the sudden disappearance of his Artesian Water, I would like to point out, that there is not much probability of the cause being such, as he is inclined to believe, viz.: "The veins having been choked in delivering Water to the well"

Such a cause is most improbable, unless the strata are very highly inclined. In that case accumulation would perhaps be formed by reason of friction' consequent upon the great velocity of the water. But should the strata be horizontal or almost so, the deposit caused by friction, would be practically nil.

There are in this case, two very probable causes.

One is, that the hole has been silted up to above where the main or strongest supply is given off. This may easily take place, if there is no lining tube through the subsoil to first impervious layer, and therefore subsoil drainage, carrying silt, has found its way into the hole.

Another reason is that in possibly going through several impervious strata when boring, these may all have been carrying water at more or less proportion, and which waters have eventually equalised themselves, that is, one has had to make up for what the other has lost.

I would consider either of the above processes, as most likely to have taken place.

Shall be glad if these remarks may be of use to your correspondent.—Yours &c.

O. W. Nicolayson.

(Board of Trade Certif.) Mar. and Mech. Engineer,
Member Royal Danish Polytechnical Institute.

Cradock, Feb. 18.

Planting Prickly Pears to Prevent Sluiting.

To the Editor, Agricultural Journal.

Sir,—I have followed with much interest the various articles and letters in your Journal *re* the evils of sluiting, more especially as the evil is largely apparent in this district.

Take, for instance, a place near here called "Behrvlei," which is shown on some of the older maps as a *lake*; a huge donga or sluit drains it now, and where comparatively young men remember that the grass and rushes stood so high that one could scarcely see cattle grazing in it, to-day there is a dusty wind-swept plain. This is only one of the many instances here and shows with what rapidity the evil is working Many suggestions have been made as to how to prevent the evil, but all are expensive and are beyond the means of the ordinary man. It is admitted on all sides that the sluits must be dammed at intervals, and vegetation induced to assist in spreading the water over the veld.

Well, Sir, a little time ago some prickly pears were cut down in a garden here and thrown into a sluit some two or three feet deep on the outskirts of the town, where they grew. Sticks, straw, sand and silt, washed down the sluit, were caught by them, and in a very short time the sluit was completely and effectually dammed. The idea is, I think, worth trying, *i.e.*, dam your sluits as far as possible and plant prickly pears in them; the rapid and tenacious growth of the prickly pear, and its ability to withstand drought, are well known. In times of scarcity it is largely fed to ostriches, and even cattle, so that it would serve a double purpose in these dry parts. Its liability to become an "evil" in some parts of the country is well known, but it would be easier to arrest its growth than to arrest sluiting. Attention was recently drawn by Mr. F. Beswick to the possibility of utilising the Non-Prickly Pear as a fodder plant, and if it is found to be as valuable as it would appear to be, it might with advantage be planted in sluits and so help to make the land, which would otherwise become a desert, "blossom as the rose."—Yours, etc.

E. L. Harries.

Petrusville, 20th February, 1905.

The Jointed Prickly Cactus.

To the Editor, Agricultural Journal.

Sir,—I endorse the observations made by Mr. Oscar E. G. Evans *re* "Jointed Prickly Cactus," and agree with him that all the other noxious weeds proclaimed are quite insignificant. Some years ago it was brought to my notice that the cactus had established itself at Middel Drift, and I reported the matter to the Divisional Council and they took immediate and effective steps for its eradication. I was in hopes that the district was clean, but on the last King William's Town stock fair I saw some adhering to the leg of an ox on the sale. It was very fresh-looking and had evidently just been picked up, so in all probability was growing on the King William's Town Commonage.

The experience of the King William's Town Divisional Council was that it is a difficult and expensive thing to eradicate; so the sooner it is attended to the better. I would request all Farmers' Associations and the Farmers' and Bond Congresses to urge on the Government and their Members of Parliament the absolute necessity of legislating for checking it before it has done the country incalculable damage and costs millions to eradicate.—Yours, etc.,

G. A. Temlett.

Fort Cox, Middle Drift, King William's Town, 22nd Feb., 1905.

The Points ot Persian Sheep.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I shall be glad if any reader will kindly furnish me with the special points showing quality and breeding in the Persian ram and ewe, as there are so many questions open amongst farmers on the proper class of animal.—Yours, etc.,

ENQUIRER.

Cape Town, 1st March, 1905.

Mules Killing Foals.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice in your issue of this month "Persevere" is making inquiries *re* Mules killing foals- I have seen a gelding mule bite a little foal like a dog would a hare, and kill it. I have had several foals injured as well as killed by mules, and D. H.'s advice should be taken in this case. Never allow mares ready to foal to run in the same camp with mules, as mules are very fond of kicking, and horse or foal is liable to suffer.

Only this year I had a mare foal which was in a small camp, running with some Horse geldings. One of the horses took a loving fancy to the little foal newly born, and drove the mother away and kept the little thing away from having Nature's nourishment. Fortunately I saw it in time to save the foal.—Yours &c.

W. J. EDWARDS.

Graaff-Reinet, Feb. 18.

Loose Teeth in Cattle.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Loose teeth in cattle is very troublesome here at the present time. The common remedy of salt and alum is useful as a temporary expedient, but its effect soon wears off, and after using it I have found the same teeth loose again within three weeks.

In Vol. XXIV, page 102, of the *Agricultural Journal*, Dr. Hutcheon recommends a mixture of common salt and Soap Ash to be given as a lick, and wood ashes to be placed within reach of all cattle in localities where this trouble occurs.

During the past twelve months I have kept a mixture of bone meal and common salt constantly before my cattle as a preventive of Lam-sickness. They lick it freely, and with excellent results. What I would like to know is: Would wood ashes from the stove added to the above mixture answer the double purpose? If so, what proportions should be used, and whether the fine white powder or the gritty portion of the ash would be best?—Yours &c.,

AMATEUR.

Keiskamma, Feb. 14, 1905.

As mentioned in the report referred to by "Amateur," I state that the principal cause of the functional defect is due principally to a deficiency of green succulent vegetable food, hence I recommended wood ashes as being, perhaps, capable of supplying at least some of the saline constituents. I would not, however, recommend it as a substitute for bone-meal, which "Amateur" says he has successfully given, but only as an addition.—D.H.

Tapeworm in Pigeons.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I herewith enclose a portion of tapeworm which I found in a wild Rock pigeon (blue). Is it usual for these birds to be infected?—Yours &c.,

M. J. B. LANGFIELD.

Tylden, Feb. 27.

Our experience of wild Blue Rock pigeons is limited, but examinations of all kinds of wild birds, as well as tame ones, show that they are very liable to harbour a variety of worms in the digestive track.—D.H.

Alleged Caterpillar (Intonjani) Poisoning.

To the Editor, AGRICULTURAL JOURNAL.

I am sending to you a specimen of caterpillar found here at Empandeni, Plumtree Siding, Rhodesia.

Natives assert that this caterpillar acts as a deadly poison when eaten by cattle or sheep.

May I ask you to kindly let me know—1st, if this assertion is true; 2nd, would this caterpillar also kill a horse when eaten by this animal producing what is called horse-sickness.

Begging to excuse me if you find my questions importune.—I am yours respectfully,

G MOREAU.

Empandeni, Plumtree Siding, Rhodesia.

The Colonial Veterinary Department has conducted feeding experiments on stock with caterpillars supposed by the Transkeian Natives to be poisonous. They call them "intonjani." The results were negative as the caterpillars in question appear to be perfectly harmless when swallowed by animals.

A Freak of Nature.

To the Editor AGRICULTURAL JOURNAL.

SIR,—I have a female goat kid bred here. She is one of a twin and 7 months old.

About 3 months ago I noticed the one side of her udder enlarged, and at first thought it was an abscess or the work of a tick. On examination I found that it was neither of the above which caused the swelling, but that the one half of the udder was full of good milk, and so much of it that I have to give relief by milking it every other day. Have any of your readers had a like experience? Yours, etc.,

IVAN PENTZ.

Progress, district Vryburg, March, 1905.

Sluiting and its Causes.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read with pleasure the (can I use the word "Masterly") letter in your issue for March, but I have the opinion that we, as farmers, are not so used to high-sounding expressions as Mr. Masters seems to be. I, along with several others, think that sluits are caused principally by grass fires, which are, as Mr. M. says, brought to be more common by the advent of the white man. When I first came to South Africa tinder-boxes only were used by Natives, now they use matches only. We are glad to see the Divisional Native Councils are waking up to the terrible inconveniences caused by grass fires, as also are all the Farmers' Associations, and one and all, bent on the urgent necessity of Government bringing in a law to stop these nuisances caused by thoughtless white and black men, who, for the sake of perhaps slightly benefitting themselves, allow the fires to spread and thereby cause a fearful amount of damage. Last year the whole country in the whole of the fearful drought was burnt, not a single atom of green was to be seen One can just imagine the new sluits opened up all over the country. Apologising for trespassing on your valuable space.—Yours, etc.,

A. V. MELLOR.

Umtata, March 10.

Vermin on Fowls.

To the Editor AGRICULTURAL JOURNAL.

SIR,—I saw in your paper a letter from Geo. S. Stewart, Dohne. I have written to him about it as I had something of the same happen to my fowls at the end of last year. The only thing I can account for Leghorns being so clean of vermin is that they are light active birds and very hardy. I have kept them for ten years.

I have advised Mr. Stewart to use the new paint called Solignum. It looks more like oil. If the wood-work is painted with it no vermin will live near it. I have been trying it in our flour mill for months in the machines and find it a complete cure for them. I have told others about it in the milling line and a number are using it, I only found this out since the new year. Price of paint, 3/9 per gallon up here.—Yours, etc.,

JOHN MCKINNON.

Queenstown, March 7th

Irrigation Queries.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice two interesting articles in the January *Agricultural Journal* on irrigation by Mr Southey and Mr. Du Toit.

(*a*) Will Mr. Southey kindly answer the following questions :—

1. What thickness of masonry wall do you advise?
2. Are your weirs perpendicular or sloping on the inside?
3. What is the size of your sluice gate (for washing out silt) in No. 1 weir.
4. What thickness of iron plates for different size sluices do you advise?
5. Are your irrigation sluices of the same pattern as the one shown in No. 1 weir, and do they lead out of the wall in the same way?

(*b*) Mr. Du Toit, in No. II, "Irrigation by arrested flood waters," says, a low wall is built below the lands and the water thrown back over the lands

I would be pleased if he would kindly inform me how the water is taken or drawn off the land when it is wanted for cultivation, and how the flood water is kept off while the land is under cultivation should a flood come down? Thanking them in anticipation,—Yours &c.,

D. B. MENNE.

Middle Valley, East Griqualand, Feb. 24, 1905.

(*b*) There is never any need to draw the water off these lands. The soil is of such a nature as to make it unnecessary—it percolates through.

A Fuchsia "Sport."

To the Editor AGRICULTURAL JOURNAL.

SIR,—I am only writing to you for a little information about a double fuchsia my wife has. For the last two and a half years the fuchsia had double red flowers. The first branch grew out about eight inches from the root; the plant then resembled a fork. About the middle of last month this branch blossomed double white fuchsia flowers. For the last two and a half years this branch had red flowers. The other branch has double red as usual. Anybody looking at the plant would think it was grafted, but it is not so. Will you kindly get an expert's opinion on the matter and publish same in your valuable *Journal?*—Yours &c.,

H. SCHWARTZKOPF.

Barkly East.

Such freaks of nature are not uncommon, and are known among gardeners as "sports." It is by watching for such a "sport" and cultivating them with a view to establishing a fixed type that new varieties are obtained.

Saltbush, Lucerne, &c.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Trusting to your well-known generosity and great fund of information, I beg to ask you for information on the following subjects;—

1. I have about 12 or 14 saltbush plants in my land, and it seems to have thrived very well, and looks as if it is full of seeds. When would be the best time to gather the seed, and which would be the best way, as I do not wish to disturb the plants or bushes themselves?

2. I have a nice lot of lucerne, and am busy stocking same. Would you give me any information as to the best methods of doing so, and the proper stage in which it is to be cut?

3. Might I enquire through your *Journal* also the best machine for cutting lucerne? I am now doing it with a scythe, but think there should be some machine on the market —Yours &c ,

H. G. ANDERSON.

Broomlands, Riverton Road.

With regard to the collecting of saltbush seed, as the plant continues to flower for a lengthened period the best time and way to collect the seed is to gather the fallen seed from the ground during dry weather.

Lucerne should be cut when it is just commencing to come into blossom. At this time it has a much higher feeding value than at any other time In dry weather it should be so dry after one day that no moisture can be pressed out of it on twisting a wisp. It may then be collected into cocks (*i e.*, heaps) about 6 to 8 feet high and 10 to 12 feet across, and left to "sweat." After a few days, dependent upon the weather, it will have heated slightly and cooled again. After this it is ready for building in a large stack or for baling, which latter is preferable if it is likely to have to be carried about, or if it is to be sold.

If you have any extent of lucerne, more than can be readily cut by the scythe, the purchase of a light lucerne mower is to be strongly recommended. Two mules or horses ought to be able to cut about an acre an hour, and it will soon repay the prime cost. Various makes are advertised in the *Agricultural Journal*, such as the "Albion," "Deering," "Ideal," "Plano," "Massey Harris," "Champion," etc.—E A. NOBBS, Agricultural Assistant.

The Ploughing of Land.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Last year in January we fallowed part of our wheat lands over, all the green weeds were turned under well.

At the end of March all the lands were ploughed over and wheat sown; the fallowed part was also ploughed again, and some of the best seed was sown on it. The result was that the wheat of the fallowed land proved to be an absolute failure. The other wheat, which was standing next to the abovementioned, and with only one ploughing, was far better; both lands were sown with the same seed, Rietti. If you could give us any information as to the cause, we should be very grateful for your assistance.—Yours, &c.,

TROLLIP BROS.

Bushman's Kop, O.R.C.

It would seem probable that in the case of the land that was ploughed twice, the ground was turned back into its original position, and much of the benefit of the first cultivation was counteracted by the second. It is, however, possible that at the first breaking of the land, the ground was not in good ploughing condition, too wet or too dry, or that it was badly ploughed, and that damage was then done which even the subsequent ploughing could not rectify. These are however, only guesses. It is very difficult to criticise a matter of this sort at a distance.—E. A. NOBBS, Agricultural Assistant.

Mangels *v* Green Oat Silage for Milk Production.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you oblige by letting me know whether yellow globe mangels are better for milk production than ensilage made of green oats. My cows graze till midday, and are then stabled. They each get one bushel cut up mangels at once, and about a bushel of steep (cut up oathay and bran) in the evening. I should like to know if the ensilage in place of the mangels would produce as much or more milk. I might mention that I milk at 4 a.m. and 2 p.m. all the year round.—Yours, &c.,

H. REID.

Belleville, March 16.

As a rule it is not a question as to which is the better food, but that mangels are only available at certain seasons, and when they are over ensilage is resorted to. Further, both vary very much in quality, and good oathay should not be compared with bad mangels, or *vice versa.* Assuming both to be good of their kind, then oathay will nominally contain, pound for pound, the same quantity of water, more than three times as much albumenoids and salts (ash), and six or eight times as much fat, though somewhat less of sugars than average mangels. It is, therefore, a more valuable and better food than mangels. Animals, however, have to get accustomed to it, and the change must be by degrees, otherwise a serious drop in the milk flow may result and be attributed to the food instead of to the suddenness of the change.—E. A NOBBS, Agricultural Assistant.

Destroying Ticks on Stock.

Interesting Experiments.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—At present so much is being written and spoken about Ticks and Dipping Tanks and Government assistance towards the erection of the latter; that I venture to think the following little experiments I carried out last week may prove of interest.

There were about 120 head of cattle operated upon. The majority being fairly well bred shorthorns.

15 Heifers and 25 Calves were sprayed with 25 per cent. paraffin and 75 per cent. water, using a Deeming Kerosene spray pump to obtain the mechanical mixture.

30 Dry Cows were dressed with 5-parts paraffin, 3-parts whale oil and sulphur to slightly thicken and applied with a long handled tar brush.

16 Young Oxen were sprayed with Cooper's Dip and soft soap mixed as directed on packet.

18 Big Oxen and 4 Bulls were dressed with Cooper's Dip without the soft soap; applied with long handled tar brush and mixed at strength of directions on packet,

Three days latter the cattle were caught and examined with the following results:—

Heifers and Calves—practically all Ticks dead.
Dry Cows—about 25 per cent. of Ticks dead.
Young Oxen—about 50 per cent. of Ticks dead.
Big Oxen and Bulls—nearly all Ticks alive.

One beast of each class was selected and thrown and all visible Ticks taken off, and examined and counted as follows:—

1 Heifer—211 dead Ticks; 2 live Ticks. These were two Red Ticks under tail.
1 Cow—41 dead Ticks; 172 live Ticks.
1 Young Ox—189 dead Ticks; 163 live Ticks.
1 Big Ox—363 live Ticks; 14 dead Ticks.

I selected the Heifers and Calves for the spray as I had heard some people state that they believed the paraffin had a tendency to harden the skin and cause stiffness. But in no case have I observed any sign of the smallest injury or inconvenience.

I think the above shows very clearly the mechanical mixture of paraffin and water s a very valuable weapon in the hands of the farmer.

In my opinion the paraffin spray is the most effectual, economical and safe method for the average South African stock farmer; whose herd generally numbers something under 400 head.

If every farmer sprayed his cattle once in every three weeks, in a very short time we should find that the Tick, if not altogether a thing of the past; would be so reduced in numbers as to cease to be a serious pest.

I should like to add that I have no interest in the sale of any spray pumps or of paraffin —Yours, &c.

C.J.V.

Coega, March 16.

Lime and Sulphur Dip.

To the Editor AGRICULTURAL JOURNAL.

SIR,—In the April *Agricultural Journal*, page 274, Mr. Tims writes on Mr. Southey's high commendation of Lime and Sulphur Dip for Scab—stating as one of the objections to this Dip, that it requires that the ingredients shall be *accurately weighed*, thoroughly boiled and used hot!

Now what is true of this Dip is that it is a compound of Lime and Sulphur, not a mixture needing accurate weighing. For if (as there should be) there is some excess of Sulphur—only so much Lime can be taken up in the combination, whether you use more or less of it. Lime is far from a pure or definite compound, and when you mix about two-parts of usual lime with three-parts of Sulphur into a paste with water - and add it, in portions at a time, with stirring, into boiling water, the lime combines with the Sulphur dissolving it in combination as a deep orange liquid, freely soluble inwater hot or cold—which neither the lime nor sulphur is. More or less of the lime makes no practical difference if there is enough for the Sulphur used and the great fault in using this Dip is mixing up an excess of lime in it, to the detriment of its safety to the wool. The Sulphur in solution is the valuable and active agent; and the less lime the better the Dip so ong as the Sulphur is dissolved. If there is some excess of Sulphur used—the best Dip is assured as against Scab, especially for that most important quality of a Dip *protection against re infection.* A strong hot Dip is the best for the farmer because, if he dips, he wants to do it well—especially to ensure against re-infection—for which purpose this Dip excels all others. Unlike a Dip that has poisonous ingredients in its composition, Lime and Sulphur can be used hot and strong, and if the dipping is somewhat more expensive, that is a small matter if it is thorough and lasting in its protection against re-infection. Of all the Dips, after all, Cooper's is the nearest ally to Lime and Sulphur, though it is not equal to it in its protective quality—and it would be a risky one to use hot and strong, though such using might last longer. The using hot, is not an essential. But all insect killers either on animals or plants are more rapid and effective if they can be applied hot. If used as Dr. Hutcheon wisely insists shortly after shearing, the Bogie of wool injuring need not frighten us against so good a remedy for Scab, and if Dip must be used on long wool, the substitute of Soda for the Lime in the combination would be a safe change—without losing the value of the strong dose of soluble Sulphur so essential to a good Dip. The accurate weighing of ingredients in Lime and Sulphur and the necessity of using hot, when so difficult to the farmer in some cases, may be dismissed.

Mr. Southey is so well able to answer for himself, that the rest may be left to him. He will forgive my say in, and lose none of his faith in Lime and Sulphur as the best and safest Dip. —Yours, &c.

W. ROE.

Graaff-Reinet, March 2.

Lime and Sulphur *versus* Imported Dip.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We have not hitherto intervened in this interesting discussion in your columns, and perhaps you will allow us a few comments.

Mr. Geldard uses the wrong adjective when he speaks of his epistle as humble, as his letter from beginning to end is one long eulogy of a preparation which is quite untried, and, except perhaps among his own acquaintances, probably quite unknown.

He evidently fancies that the manufacture of a sheep dip is as simple as he imagines your readers to be, and he must be foolish if he thinks the taxpayers of South Africa will take him at his word and put his preparation on the market for him free of charge.

It seems to be forgotton that there are over sixty sheep dips offered for sale in this country, but not more than ten of them to our knowledge find a market; the others are not stocked by storekeepers, and if supplies are sent to the depôts they lie there for years unsold.

Mr. Southey (whose enterprise we all admire) seems to have used one of the fifty odd dips which have been tried in this country and found wanting, but his sense of justice must be somewhat warped if he thinks it fair that dips such as Hayward's should be excluded because a certain dip he tried was worse than useless. Surely Mr. Southey has no objection to merit!

If lime and sulphur is as valuable a remedy as "Hayward's Sulphur Paste," it should not be necessary to give it an unfair advantage over its competitor. Yet, notwithstanding official and non-official support, such as free distribution, etc., the farmer will *not* believe that lime and sulphur is innocuous to his clips, and the only result of placing a duty on imported dips would be to enhance the cost of farming small stock.

Mr. Cockin avers that with imported dips he cannot keep his sheep clean for more than a few months. Will he please refer to Mr. Lindsay's letter in the *Agricultural Journal* some months ago; or, if that does not satisfy him, he can avail of our guarantee to return the cost of "Hayward's Sulphur Paste" should it be found ineffectual. Hayward's Paste is the only dip that has been publicly guaranteed, but we have never yet had a single application for a refund.

Allow us to thank you for the pleasure and information your journal gives us monthly, and for the excellence of its contents and general get up.—Yours faithfully,

HAYWARD, YOUNG & CO.

Port Elizabeth, March 15.

Mr. Timson in Reply.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Let me assure Mr. Southey that I meant no sarcasm in anything contained in my last letter to you. I wrote in real sincerity.

When referring to the necessity for care and accuracy in the preparation of Lime and Sulphur Dip, I was so anxious to avoid even the appearance of making Mr. Southey say what he did not that I used his own words.

During the Lime and Sulphur days, the Australian authorities insisted that, to make certain of cure, the temperature of the bath should be kept up to 110° which the Government Regulations prescribed. Could they have depended upon curing with a cold Lime and Sulphur bath, they never would have made compulsory its use hot.

Lime and Sulphur Dip is declared by the Cape Agricultural Department to be powerless against ticks and only arsenical dips effective. Farmers will recognise the immense advantage of using a dip which will destroy all three—Scab, Ticks and Lice—at the same dippings.

The letters I sent Mr. Southey were from Wool Experts all over the world relating experiences of injurious effects of Lime and Sulphur upon the Wool. They were not written as testimonials, and there was little or no "cracking up" of any dip, but much "running down" of Lime and Sulphur Dip. Mr. Southey tells us that the opinion that Lime and Sulphur Dip only should be used is growing amongst all the most enlightened and progressive farmers. The almost unanimous rejection of Mr. C. Southey's motion at the Farmers' Congress indicates distinctly the reverse.

Mr. Southey says the extensive use of Cooper's Dip does not speak well for imported Dips. Can he reconcile this with the just issued official returns of the Chief Inspector of Sheep, showing that, so recently as December last, 93 per cent. of the Sheep in the Colony were free from Scab, and with the fact that, in the Transkei, which is admitted to be very much cleaner than the Colony, nothing but imported dips are used.

If, in place of his present campaign against those dips, Mr. Southey will start one strongly urging care and thoroughness in the use of dips (the lack of these essentials is a most fruitful source of failure to cure Scab), he will help forward the good cause of

Scab eradication very much more than he ever will do by pursuing his present course. The rejection of his brother's motion by the Farmers' Congress should convince him of that.

Isolated cases of success or failure with any dip are much more likely to mislead than to offer safe guidance. The only real test of the comparative value of different dips is the use of each in the ordinary course of farming, upon a like number of Sheep of the same class running together on the same veld throughout the varying conditions of several seasons, and giving the judgment on the condition of the Sheep and Wool at the Shearings. So judged, as it often has been, the dip I am connected with has never yet come off second best.

The record of a particular flock, which Mr. Southey quotes in favour of Lime and Sulphur, is vitiated by his own statement that "only the best were retained."

While the use of a good dip is of immense importance, there are many other things which have their influence upon the economic results of Sheep and Woolgrowing.—Yours, &c.

S. Rowland Timson,

General Manager,

William Cooper & Nephews, M.R.C.V.S.

Gonubie Park, March 13.

RURAL REPORTS.

For the month ending 15th March, 1905.

Aberdeen.—Heavy rains fell here towards the end of February, and veld is now beginning to grow. Weather at present is fair. Only crop at present is mealies, and prospect is poor. Lucerne is looking up after the rain. Vines have now fulfilled expectations. Livestock of all descriptions remain about the same as last month.

Bedford.—Partial storms have passed over this district during the last month, but most of the farms are still absolutely dry and have had no rain. What rainfall there has been is considerably below the average. There is every appearance of a great portion of the veld being quite dead on account of the prolonged drought. Even where rain has fallen the grass is recovering very slowly. Lucerne is growing very well where farmers have been able to keep it well watered. Fruit bad on account of drought. Cattle generally are in low condition and dying from poverty on most farms. Slaughter stock scarce and not in good order. Sheep are in very fair condition, considering the drought; lambs doing well so far. Ostriches are still in low condition, but improving fast on the farms which have been favoured with rain.

Clanwilliam.—Weather stormy. A better rain has fallen than last season, but veld is still dry. Apples are good in some parts of this district, but largely infested with worms. Cattle are in good condition for this time of year, and there is no sickness. Slaughter animals realising good prices. Horses are in very good condition, draught animals scarce. Prices £25 to £60. Small stock in very fair condition and little scab. Ostriches doing well. Pigs thriving.

Griquatown.—We have had an average rainfall this month, and veld is beginning to look up, although it could do with another rain or two. Weather seasonable and favourable. Horses, mules, etc., are in good condition and fetching fair prices. Sheep doing well for the time of year.

Oudtshoorn.—Veld here is in rather dry condition still, although an average rain has fallen. We are experiencing very fair weather at present. A good crop of oats has been harvested, but mealies do not promise well, owing to the effects of the drought. Lucerne is growing very well. Fruit generally doing nicely and no disease at present. Calving season promises to be very fair. Horses in good condition but scarce and prices high. Small stock thriving. Ostriches have not bred so well this season. Pigs doing well.

Queenstown.—Only light rains have so far fallen, the total fall being a good way below the average. The weather itself has been very changeable, the latter part of February was quite wintry. Veld is in very poor condition, owing to drought. Cattle still in poor condition. Calving fairly satisfactory. Horses in fair condition. Sheep doing well, considering the drought.

Robertson.—Veld here is in very bad condition. Rainfall for the month has been very light and weather is at present dry. Mealies in good condition. Lucerne rather dry, but still growing well. Livestock of all descriptions are in good condition and doing well.

Somerset East.—The district is still suffering from the effects of the drought. The rainfall, which has been far below the average, has not been sufficient to improve the pasturage, which is still very dry. Livestock of all descriptions is in very poor condition. Ostriches are doing badly, and a number of full-grown birds have died. Slaughter stock very scarce. Unless copious rains soon fall, the outlook for the winter is serious.

Steytlerville.—This district is still suffering from drought. In one or two spots rain has not fallen for eighteen months. In the most favoured parts of the district ·69 of an inch fell in February, nothing in January, ·50 in December. So that the drought is not broken. and very many dams are useless. Farmers are keeping their young stock alive with some difficulty. Calves are being fed with the mistletoe which grows on the mimosas by farmers who live along the course of the Groote River. As the Pruim Bosch on the hills is in fruit, the larger stock are fattened and nourished by it. The farmers are now doing their best to encourage the growth of this invaluable bush. It was nearly exterminated some years ago, as its branches were used for plaiting the fences of ostrich enclosures. The bareness of the veld and the barrenness of the hills and mountains here are largely due to this destruction.

THE TRANSKEI.

For the month ending 28th February, 1905.

Bizana.—Good rains have fallen throughout the District and all the crops are exceedingly promising in consequence. Stock of all kinds are in splendid condition and free of any disease.

Cofimvaba.—The rainfall for the month was 3·08 inches and in consequence the grazing veld is in splendid condition, and in those parts of the district where it was found possible to sow mealies in time, the rains will have had a beneficial effect, besides enabling the Natives to put in late crops of wheat, forage and beans. Stock generally has improved very much. Horses and small stock appear to be fairly free from disease, but cattle in several parts of the district have become affected with Redwater. During January five areas were quarantined for Redwater, and this month four more were quarantined in one area for Lungsickness, the total losses from both diseases during the two months are nineteen head of cattle.

Flagstaff.—Owing, to the plentiful rains the agricultural prospects are at present very promising. The crops look well and if the wet weather continues, a fair harvest may be expected. Pasturage is exceptionally good just now, and stock of all classes are doing well. The District is free from infectious and contagious diseases.

Idutywa.—The rainfall registered during the month of February last amounted to 2½ ins., and the veld has now much improved, there being ample pasturage for stock, which is in good condition. No outbreaks of contagious diseases have been reported during the month.

Kentani.—There is little to add to my report for January. Moderate rains continued to fall during the month now closing and the crops, though still very backward in parts, are looking well. Pasturage is plentiful and good.

Libode.—There has been an abundant rainfall during the month. The Natives entertain great hopes that notwithstanding the lateness of the rains, they will be able to reap a fair crop, but of course this all depends upon a late frost. One case of lungsickness has been reported, otherwise stock of all kinds in excellent condition.

Matatiele.—During the past month a rainfall of 3½ inches was registered in this village, distributed over 16 days, and rain fell generally throughout the district. Crops have come on apace and the prospects of a fair grain season may be anticipated, provided frosts keep off for another month, and the weather becomes warmer. Several fresh cases of redwater occurred and were dealt with, otherwise all stock are doing well

Mount Frere.—Glorious rains have fallen during the month, and the crops have improved in a marvellous manner. There is every prospect of a fair average yield. The veld is in grand condition, and all kinds of stock are doing well. There has been one outbreak of lungsickness reported during the month, and several cases of redwater. The usual precautions were adopted to prevent the spread of these diseases. Slaughter stock are in good condition, though scarce. Scab is still prevalent amongst horses.

Ngqeleni.—Continued good rains have fallen in the district during February and the country is in very good condition. The mealie crops near the coast are being reaped by the natives for eating purposes, but those higher up in the district are very young but looking well. Stock, of all descriptions, is doing well and no outbreaks of animal diseases have been reported.

Nqamakwe.—Good rains fell during the past month and the mealie crops sown at the beginning of the year are looking well, but owing to the lateness of the sowing it is not likely that any harvest will be obtained unless frosts keep off much later than usual. The veld is now excellent and cattle have improved considerably in condition. Cases of glanders in horses were discovered in this village and at a trading station in the district. Locusts seem to have disappeared entirely.

Tabankulu.—Owing to plenteous rains during the past month there is every hope of a fair crop of mealies and a small one of Kaffir corn. Owing to the prolonged drought very little tobacco seed was planted. An outbreak of red-water is now moderating and will, I trust, shortly disappear.

Tsolo.—Good rains fell during the past month ; the pasturage and crops are now excellent. Both large and small stock in good condition. Two cases of outbreaks of lungsickness were reported, and the herds quarantined.

Tsomo.—Under the influence of soft penetrating rains, the pasturage in this district has steadily improved, and with it the stock. Redwater has, however, become rife, as is usual here after the summer rains. The few standing mealie crops are looking well, but their ultimate quality depends on the absence of frosts. Forage and beans are progressing favourably.

Umtata.—It is with great pleasure that I am able to report that the terrible drought which has been experienced in this district for the past twelve months appears to have been broken up. Continuous showers of heavy rain have fallen, and the rivers are overflowing in all parts of the country. Already pasturage and stock are showing the effect of the change. The crops which have survived the drought look promising, and a small harvest is expected. One case of Redwater has been reported, and promptly quarantined.

Willowvale.—Value of stock is slightly decreasing, cattle ranging from £8 to £10 and horses £15 to £20. All stock is in good condition. No outbreak of infectious diseases was reported during the month. During the month about four inches of rain fell, and the pasturage is splendid. Should the rains continue, there is some hope of the natives reaping a quarter crop of mealies. No corn will be reaped. Vast swarms of "voetganger" locusts have appeared in the district, but every step is being taken to destroy them The fruit crop was a failure.

NOTES ON THE WEATHER OF FEBRUARY, 1905.

By Charles M. Stewart, B.Sc., Secretary to the Meteorological Commission.

Cloudy, windy weather, cool for the season, with frequent fogs and mists, frequent thunderstorms, some destructive hailstorms, and a generally increased rainfall over that of January last, were the leading features of the weather of February.

Precipitation.—The mean precipitation of last month, based on the records from 352 raingauges, was 2·64 inches falling on 8 days, being 0·32 in. or 14 per cent. above the normal. Comparing last month's rainfall with that for January, it will be noticed that except over the South-West and West Coast Divisions, there has been a satisfactory increase in the quantities recorded (although there is still a serious deficiency over the Karroo and the Northern Border), causing a break in the drought over a large area, with the result that the veld is getting once more into excellent condition, with a promise of mealie crops in the East if early frosts do not interfere with their growth. The rains were fairly general, only 11 stations reporting "nil," while 81 had 1 in or less; 67 between 1 and 2 inches; 56 between 2 and 3 inches; 49 between 3 and 4 inches; 31 between 4 and 5 inches; 20 from 5 to 6 inches; 13 from 6 to 7 inches; 8 from 7 to 8 inches, and 6 over 8 inches; the largest amount was recorded at Evelyn Valley, viz., 10·26 inches, Maseru coming next with 9·13 inches; the remaining four were Woodifield (George)

Division.	Mean Rainfall. (1905).	Mean No of Days.	Average Rainfall. (1894-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
	Inches.		Inches.		Inches.	Percentage
Cape Peninsula ..	1·01	3	0·78	3	+ 0·23	+ 29
South-West ..	0 38	2	0·75	2	− 0·37	− 49
West Coast ..	0·21	1	0·30	1	,, 0·09	,, 30
South Coast ..	3 86	9	2·07	6	+ 1·79	+ 86
Southern Karroo ..	1·08	3	1·01	3	,, 0·07	,, 7
West Central Karroo	0 85	3	1·10	3	− 0·25	− 23
East Central Karroo ..	1·56	6	1·84	5	,, 0·28	,, 15
Northern Karroo ..	1·65	5	1·98	5	,, 0·33	,, 17
Northern Border ..	1·87	6	1·93	6	,, 0·06	,, 3
South-East ..	3·68	10	3·06	8	+ 0·62	+ 20
North-East ..	3·60	11	3·47	9	,, 0·13	,, 4
Kaffraria	4·84	13	3·69	10	,, 1·15	,, 31
Basutoland ..	6·48	14	..	..	..	..
Orange River Colony ..	4·64	13	..	..	..	..
Durban (Natal) ..	5·48	14	4 50	..	+ 0·98	+ 22
Bechuanaland ..	3·57	11	3·20	8	,, 0·28	,, 9
Rhodesia	5 36	11	..	..	..	..

with 9·13 inches; George (Plantation), 8·79 inches; Insekeni, 8·48 inches, and George (Gaol) with 8·41 inches. On subjecting the maximum falls in 24 hours to a similar scrutiny, it is found that out of 328 stations, 198 had maxima of 1 inch or less, 108 between 1 and 2 inches; 15 between 2 and 3 inches, and only 6 over 3 inches. Concurrently with the violent black "south-easter" which raged over the Cape Peninsula on the last day of the month, causing damage to fruit and trees in the Groot Drakenstein District, there set in a fairly general rain over the Colony, accompanied by a number of thunderstorms, in connection with which occurred the heaviest falls of the month; the greatest daily fall was 5·39 inches at George Plantation on the 28th; then in order come George (Gaol) with 4·75 inches; Woodifield 4·54 inches; Plettenberg Bay, 4·20 inches; Aberdeen (Bedford), 3·22 inches; Aberdeen (Gaol), 3·15 inches; Herschel, 2·75 inches; Maseru. 2·58 inches. *Thunderstorms* were reported almost daily, there being altogether 420 on 26 days of the month, chiefly from 6th to 8th, 10th, 21st, 22nd and 28th. Associated with these there were reported 40 cases of *hailstorms* chiefly on the 2nd, 7th, 8th and 22nd. *Sleet* was reported from one station on the 28th.

Temperature, Cloud and Wind.—The mean temperature of all the stations was 69·2° or 1·9° lower than January and slightly (0·2°) lower than in February, 1904; the mean maximum temperature was 79·9° and the mean minimum 58·6°, giving a mean daily range of 21·3°, almost 1½ degrees less than in January. The monthly temperature was everywhere below the average, especially in the East, by amounts varying between 0·3° at Simonstown and 2·0° at East London, the effect being almost equally divided between day and night temperatures. The mean warmest station was Kenhardt, with a temperature of 79·0°, and the mean coolest station Disa Head, with 60·7°.

Kenhardt also shows the highest mean maximum of 93·2° and Ceres the lowest mean minimum of 52·9°. The warmest periods were from 2nd to 3rd, 11th to 13th and 21st to 23rd, when the absolute maxima were mostly recorded, while the coldest mornings were those of 4th, 15th to 17th, and 24th to 27th. The absolute maxima averaged 92° and the absolute minima 50·0°, giving a mean monthly range of 42°; while the extremes for the month ranged from 105·0° on the 21st at Robertson to 38·0° on the 7th at Ceres, thus showing an extreme monthly range over all the stations of 67°.

The mean *cloudiness* for the month was 45 per cent. or 1 per cent. more than during January and 4 per cent. less than the previous February. Over the South West, it was mostly between 20 and 30 per cent., increasing to 69 per cent. at Cape L'Agulhas; between Cape St. Francis and Port St. John's and inland it was mostly about 50 per cent.; further inland it was between 30 and 40 per cent. rising again to 65 per cent. at Hope Fountain in Rhodesia. The maximum amount of sky obscured was 70 per cent. at Umtata and Port St. John's and the minimum 15 per cent. at Kenhardt. *Fog* or *Mist* was reported from 88 stations on 22 days of the month.

Taken as a whole the month was exceptionally windy, the mean force being 2·06 on the Beaufort Scale, corresponding to a velocity of 13·3 miles per hour. The wind attained the force of a gale on six days of the month at seven stations The prevailing directions were Southerly in the South-West, Westerly along the South Coast, North-Westerly to North-Easterly in the East, and South-Easterly inland. *Hot Winds* were reported from 2 stations on 21st and 28th and *Dust Storms* from 8 stations on 4 days of the month.

Pressure varied from 30·04 ins. at Cape L'Agulhas to 29·99 ins. at Clanwilliam, the isobar of 30·03 ins. running along the coast between Royal Observatory and Port Elizabeth; at Durban the mean pressure for the month was 30·02 ins.

The following extracts from the observers' notes will show that generally speaking there has been a decided improvement over the greater part of the Colony;—

OBSERVERS' NOTES.

VRUCHTBAAR.—Busy gathering the grape crop, which is a fairly good one. Continuous S.E. winds.

MIDDLEWATER.—Violent thunderstorm on the 7th accompanied by hail, wind and rain the hailstones being very large. The wind unroofed several buildings here and tore up large trees by the root.

ROODEBLOEM.—Veld starting to grow, will however require a good deal more rain to recover.

NOTES ON THE WEATHER OF FEBRUARY, 1905.

Boschfontein.—Unusually cool weather prevailed during the month. South and South-Easterly winds frequent. Rains very partial Winged and hopper locusts about but entirely destroyed by locust birds—small and large. The former appeared in immense flights and gave their attention strictly to business with the result that at the end of the month scarcely a locust was to be seen.

Middelburg.—Fruit of all kind, plentiful and cheap. Potatoes scarce and dear; 15s. to 17s. a bag.

Vosburg.—Veld on most of the farm is reported to be growing well. No locusts. Nearly all dams have water.

Alexandria.—No crops except mealies, which suffered much from drought.

Stutterheim.—Country getting into very good state—very green for winter. No locusts reported. Stock doing well; a few cases only of lung sickness.

Sunnyside.—Mealie crop half a failure, owing to previous month's drought.

Carnarvon Farm.—This has been a very mild month, only two windy days. No cloudless days. Heaviest February rainfall since 1901, which was 5·69. From weather reports and other information, we, at Carnarvon Farm, have had more rain than most other places. The question is whether our half million trees influence the rainfall.

Keilands.—Veld in excellent condition; stock improving.

Tabankulu.—The grass up to this month was scanty, but it is now luxuriant. There will be mealie crops if no frosts.

Wanstead.—Mealies well in flower; green barley well up; wheat just shooting; turnips very promising; hay crop excellent: veld excellent.

Groot Drakenstein.—A miserable month of almost incessant wind. Temperature almost normal and rainfall slightly below. Country very dry and scorched.

TEMPERATURE, FEBRUARY, 1905.

Stations.	Mean Max.	Mean Min	Monthly Mean	Abs. Max.	Date.	Abs. Min.	Date.
Disa Head (Table Mountain)	66·8	54·6	60·7	83·0	21	50·0	4
Devil's Peak	70·2	56·8	63·5	83·0	21	51·0	22
Cape Town (S A C) ..	80·2	61·2	70·7	95·0	12	54·5	27
Wynberg	75·0	59·5	67·3	84·0	18	54·0	4
Sea Point	78·6	60·0	69·3	89·0	12	55·5	27
Simon's Town .. .	77·9	64·0	70·9	83·1	1	59·0	15
Groot Constantia ..	73·9	58·7	66·3	82·0	19	52·0	27
Robertson (Govt Plantation)	87·2	56·1	71·7	105·0	21	45·0	15
Wellington	83·9	60·7	72·3	94·8	21	52·2	16
Groot Drakenstein ..	84·5	61·0	72·7	99·4	21	52·3	17
Ceres	92·1	52·9	72·5	104·0	11 & 12	38·0	7
Elsenburg (Agri. College) ..	80·4	54·2	67·3	93·0	21	46·0	27
O'okiep	85·6	58·4	72·0	96·9	20	48·7	24
Knysna	73·3	59·0	66·2	87·0	21	51·0	16 & 27
Cape St Francis ..	74·4	63·1	68·7	79·0	7	54·0	16
Port Elizabeth ..	75·3	63·6	69·5	78·5	10	56·5	16
George (Govt. Plantation) ..	74·0	58·0	66·0	81·8	21	48·0	27
Heidelberg	77·4	58·1	67·7	92·0	3	48·0	16
Van Staaden's River ..	77·1	58·2	67·6	99·0	13	49·3	16
Cape L'Agulhas ..	73·0	63·8	68·4	78·0	11	57·0	16
Storms River	76·4	55·8	66·1	90·0	21	50·0	27
Amalienstein	85·9	57·8	71·8	98·0	13	47·0	27
Rust en Vrede	80·3	54·4	67·4	92·0	13 & 21	45·0	16 & 27
Graaff Reinet	86·4	57·9	72·1	99·8	13	47·9	27
Wagenaar's Kraal ..	85·0	54·9	70·0	93·0	12, 13 & 21	42·0	26
Murraysburg	84·2	56·2	70·2	94·0	3, 13 & 21	47·0	25 & 26
Hope Town	89·4	61·4	75·4	98·2	2	55·0	24 & 26
Kimberley	89·8	61·7	75·7	99·8	2	53·0	25
Kenhardt	93·2	64·7	79·0	101·0	1, 2 & 21	56·0	25
King William's Town ..	83·4	60·9	72·1	101·0	13	50·5	15
Bedford	81·8	56·6	69·2	98·0	14 & 23	46·0	27
Stutterheim	77·1	58·3	67·7	95·5	13	48·0	25
Sydney's Hope	78·5	56·8	67·7	98·2	13	51·0	26
East London West ..	74·2	62·7	68·4	79·0	19 & 23	55·0	26
Grahamstown	80·1	56·0	68·1	98·2	13	46·0	16
Aliwal North	82·5	56·2	69·3	93·0	2	48·5	1
Doornkop	76·7	53·7	65·2	89·2	3	42·4	26
Rietfontein (Aliwal North) ..	79·0	54·4	66·7	90·1	2	44·1	26
Matatiele	77·5	54·8	66·2	86·7	13	41·0	26
Kokstad	76·5	54·9	65·7	95·0	13	45·5	26
Umtata	78·0	61·2	69·6	98·0	4	54·0	26
Port St. John's	77·8	65·7	71·7	83·0	14 & 19	60·0	26
Mount Ayliff	78·0	58·4	68·2	96·0	4	49·0	25
Main	76·2	57·2	66·7	91·6	22	48·0	26
Kuruman	84·9	60·0	72·5	91·0	3,10,20 & 21	50·0	25
Hope Fountain.. ..	80·5	61·0	70·7	92·2	4 & 11	56·1	28
Means	79·9	58·6	69·2	92·0	..	50·0	..
Extremes	..	..	..	105·0	21	38·0	7

RAINFALL, FEBRUARY, 1905.

I. CAPE PENINSULA:	INCHES
Royal Observatory, (a) 12 inch gauge	0·59
Cape Town, Fire Station	0·20
Do South African College	0·28
Do Sea Point (Hall)	0·26
Do do. (Attridge)	0·26
Do Molteno Reservoir	0·38
Do Platteklip	0·81
Do Signal Hill	0·28
Table Mountain, Disa Head	2·34
Do Kasteel's Poort	1 35
Do Waai Kopje	2·41
Do St. Michael's	3·30
Devil's Peak, Block House	1·74
Do Nursery Gauge	1·87
Do Lower Gauge	2·38
Wynberg (St. Mary's)	0 47
Groot Constantia	0·58
Tokai	0 30
Simon's Town (Wood)	0·79
Do. (Gaol)	0·88
Robben Island	0·26
Fish Hoek	0·65
Cape Point	0 63
Woodstock	1·10

II. SOUTH-WEST:	
Klapmuts	0·27
Stellenbosch (Gaol)	0·30
Somerset West	0 30
Wellington (Gaol	0·14
Groot Drakenstein	0·30
Tulbagh	0·05
Kluitjes Kraal	0 09
Ceres	0·10
Caledon	0 02
Hex River	0·30
Lady Grey (Div. Robertson)	0 07
Robertson	0·36
Robertson (Govt. Plantation)	0 31
Montagu	0·00
Porterville Road	0·00
Rawsonville	0·00
The Oaks	0 15
Danger Point	1 96
Vijgeboom's River	0 74
Elsenburg Agricultural College	0 18
Roskeen	2·45
Vruchtbaar	0·16

III. WEST COAST:	INCHES
Klipfontein	0 00
O'okiep	0 00
Springbokfontein (Gaol)	0·00
Concordia	0·00
Garies	0·02
Kersefontein	0·00
Dassen Island	0·26
Malmesbury	0·04
Piquetberg	0·05
Van Rhynsdorp	0·00
Clanwilliam (Gaol)	0 43
Zoutpan	0·00
Wupperthal	1·94

IV. SOUTH COAST:	
Cape L'Agulhas	0·99
Bredasdorp	4 10
Swellendam	3 73
Heidelberg	2 16
Geelbek's Vlei	2·88
Mossel Bay	1·36
George	8·41
Millwood	3·70
Sour Flats	5·21
Concordia	5·98
Knysna	4 50
Buffels Nek	4·37
Harkerville	3·19
Plettenberg Bay	6·02
Blaauwkrantz	7·26
Storm's River	5·81
Witte Els Bosch	5·80
Cape St. Francis	0·95
Potberg	3·47
Witteklip	2·58
Van Staaden's (upper)	3 93
Do. (lower)	3·28
Uitenhage	2·63
Port Elizabeth (Harbour)	2·12
Shark's River (Nursery)	1·99
Do (Convict Station)	1·79
Grootvader's Bosch	6 20
Zuurbraak	4·42
Vogelvlei	1·60
Great Brak River	2 92
Kruis River	1·55
Armadale	2·59
Centlivres	1·09
Woodifield	9·13

V. SOUTHERN KARROO:	
Ladismith	1 27
Amalienstein	0·95
Calitzdorp	1 00
Oudtshoorn	0·71
Uniondale	0·15
Kleinpoort	0·81
Glenconnor	1·45
Rustenvrede	2·28

VI. WEST CENTRAL KARROO:

	INCHES
Prince Albert Road	0·03
Fraserburg Road	0·79
Prince Albert	0·35
Zwartberg Pass	3·28
Beaufort West	1·70
Nel's Poort	0·71
Camfer's Kraal	0·68
Lower Nel's Poort	0·61
Baaken's Rug	0·55
Willowmore	0·76
Steytlerville	0·87
Roosplaats	9 33
Krom River	0 46

VII. EAST CENTRAL KARROO:

Buffelskloof	0 53
Aberdeen (Gaol)	3·85
Aberdeen Road	3·98
Aberdeen (Bedford	1·37
Rietfontein	0 78
Winterhoek	2·10
Kendrew	1·25
Graaff-Reinet	1·21
Do (College)	1·06
New Bethesda	1·38
Roode Bloem	1·76
Jansenville	1·03
Patrysfontein	1·91
Toegedacht	0·46
Klipfontein	0·73
Pearston	0 84
Somerset East	2·83
Middleton	2·29
Corndale (Div. Aberdeen)	2·21
Cookhouse	1·74
Middelwater	1·61
Glen Harry	0·63
Bloemhof	1·34
Roode Hoogte	1·37
Walsingham	0·62
Arundale	0·65
Spitzkop	2·00

VIII. NORTHERN KARROO:

Sutherland	0·19
Fraserburg	0·97
Droogefontein	2·77
Carnarvon	0·71
Wagenaar's Kraal	0·44
Brakfontein	0·66
Victoria West	0·79
Britstown	1·58
Murraysburg	1·08
De Kruis	0·56
De Aar	2·36
Middlemount	1·98
Philip's Town	1·37
Boschfontein	1·79
Petrusville	0·00
The Willows	1·60
Middelburg	1·80
Colesberg	1·32
Tafelberg Hall	1·42

VIII. N KARROO—*Continued*

	INCHES
Cradock	2·06
Do. (Station)	1 86
Witmoss	1·62
Steynsburg	2 63
Quagga's Kerk	2 42
Tarkastad	2 71
Riet Vlei	3 67
Omdraai's Vlei	3·10
Varken's Kop	2·27
Doorskuilen	1·43
Hillmoor	2 08
Glen Roy	3 64
Fish River	3·00
Schuilhoek	2·25
Vosburg	1·75
Loxton	0·92
Scorpions Nek	0·40
Wildebeestkooij	1·23
Maraisburg	1·91
Waverley	2·53
Gannapan	0·65
Montagu	0 91
Rietfontein (Cradock)	1·17

IX. NORTHERN BORDER:

Kenhardt	0·3
Van Wyk's Vlei	1 01
Prieska	1 06
Dunmurry	4·23
Griqua Town	1 84
Campbell	0·97
Douglas	1 98
Hopetown	0 91
Newlands (Div. Barkly West)	2 79
Kimberley (Gaol)	2·86
Do. (Stephens)	3·22
Barkly West	2 73
Upington	1 39
Trooilapspan	1·11
The Halt	1·94
New Year's Kraal	1·41
Karree Kloof	1 94

X. SOUTH-EAST:

Melrose	1·80
Fairholt	2·26
Cheviot Fells (Bedford)	1·38
Alicedale	1·42
Bedford (Gaol)	3 44
Do (Hall)	3·33
Sydney's Hope	2·14
Cullendale	3·72
Adelaide	2·81
Atherstone	1·73
Alexandria	2 22
Salem	2·70
Graham's Town (Gaol)	1·81
Do. (Bact. Inst.)	1·76
Heatherton Towers (near Graham's Town)	0·86
Fort Beaufort	4·69
Katberg	7·32
Balfour	5·36
Seymour	3·98
Glencairn	4·91

X. SOUTH-EAST—*Continued*	INCHES
Hogsback	6·78
Thaba N'doda	5·65
Peddie	2·13
Cathcart	3·92
Keiskama Hoek	5·19
Thomas River	2·62
King William's Town	2·84
Do. Hospital	3·55
Stutterheim (Wylde)	4·09
Do (Besté)	4·06
Dohne	3·68
Daggaboer	1·64
Lynedoch	3·01
Kubusie	4·65
Blaney	2·19
Kei Road	3·78
Evelyn Valley	10·26
Berlin	2·99
Isidenge	6·09
Perie Forest	5·15
Quacu Forest	2·72
Kologha	4·73
Fort Jackson	0·20
Komgha	3·23
Prospect Farm (Div Komgha)	2·96
East London, West	3·51
Do East	3·56
Fort Cunynghame	3·92
Bolo	3·87
Fort Fordyce	5·25
Sunnyside	1·80
Forestbourne	7·02
Cata	5·51
Wolf Ridge	6·07
Dontsah	5·90
Mount Coke	2·15
Blackwoods	4·72
Albertvale	2·37
XI. NORTH-EAST:	
Indwe	4·84
Venterstad	0·82
Molteno Station	3·65
Cyphergat	3·69
Thibet Park	2·25
Sterkstroom	2·98
Do (Veitch)	3·27
Rocklands	3·04
Aliwal North (Gaol)	2·88
Do. (Brown)	3·09
Rietfontein	4·05
Hex's Plantation	4·37
Carnarvon Farm	4·36
Jamestown	2·54
Queenstown (Gaol)	3·81
Dordrecht	2·48
Herschel	7·91
Lady Grey	6·05
Lady Frere	3·92
Keilands	4·75
Lyndene	0·97
Mooifontein	1·34
Poplar Grove	2·52
Whittlesea	2·67

XI. NORTH-EAST—*Continued*	INCHES
Halseton	3·15
Sterkspruit	7·62
Doornkop	3·94
Palmietfontein	4·09
Blikana	5·72
Table Hill	5·14
Albert Junction	1·14
Glen Wallace	3·62
XII. KAFFRARIA:	
Ida, Xalanga	6·64
The Willows (Kokstad)	6·01
Cofimvaba	3·93
Nqamakwe	4·69
Main	3·24
Engcobo	6·87
Butterworth	3·56
Kentani	3·36
Idutywa	2·51
Willowvale	4·40
Mount Fletcher	4·35
Elliotdale	3·74
Mqanduli	2·60
Matatiele	3·51
Umtata	4·97
Kokstad	4·57
Port St. John's	5·28
Umzimkulu	3·17
Tabankulu	6·22
Somerville (Div. Tsolo)	4·83
Tsomo	3·26
Bazeya	7·19
Mount Ayliff	5·42
Seteba	4·39
Flagstaff	6·07
Insikeni	8·48
Mandileni	7·92
Wanstead	4·39
Cedarville	4·70
XIII. BASUTOLAND.	
Mafeteng	4·89
Qacha's Nek	5·35
Maseru	9·20
XIV. ORANGE RIVER COLONY:	
Bethlehem	3·36
Imperani	6·08
XV. NATAL	
Durban, Observatory	5·48
XVII. BECHUANALAND:	
Vryburg	5·27
Mafeking	2·44
Doornbult	4·32
Setlagoli	2·01
Kuruman	5·66
Zwartlaagte	1·72
XVIII. RHODESIA:	
Hope Fountain	7·40
Belingwe	3·05
Matopo Park	5·69
Fort Rixon	6·11
Luscombe Farm	5.43

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 18th March, 1905, ruling at the several centres named, is published for general information :—

CENTRE.	A Wheat per 100 lb.	B Wheat Flour per 100 lb	C. Boer Meal per 100 lb.	D. Mealies per 100 lb	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H Oat-hay per 100 lb	J. Potatoes per 100 lbs.	K Tobacco (Boer Roll per lb.	L. Beef per lb	M. Mutton per lb.	N. Fresh Butter per lb.	O. Eggs per doz	P. Cattle (Slaughter)	Q. Sheep (Slaughter.
	£ s d	£ s. d	£ s d	£ s. d	£ s d	£ s. d.	£ s d.	£ s. d	£ s. d.	£ s d	s. d	s d	£ s. d.	s. d		
Allwal North ...	0 12 0	0 14 0	0 13 6	0 7 6	0 9 0	0 10 0	0 9 0	0 7 6	0 9 0	1/6 to 4/-	0 9	0 7	0 1 0	3 3	£13 10s.	24/-
Beaufort West ..	0 12 0	0 17 0	0 13 0	0 8 3	0 12 6	0 10 0	0 8 0	0 5 6	0 5 3	0 0 7	6d to 11d	0 7½	0 2 0	1 6	£18	26/6
Burghersdorp ...	...	...	...	...	...	...	...	...	0 8 6	...	...	0 8½	0 1 0	2 0	...	...
Cape Town ...	0 9 9	0 12 4	0 10 0	0 6 9	0 8 3	0 6 0	0 5 4	3/- to 3/3	0 8 0	0 0 8	0 10	0 10	0 1 1	20/- 100	£16 to £20	25/-
Clanwilliam ..	0 11 3	1 10 0	0 12 3	0 10 0	...	0 12 0	0 7 0	...	0 10 0	0 4 6	0 8	0 7	0 1 6	1 3	...	...
Colesberg ...	...	...	...	...	...	...	...	0 7 6	0 12 6	...	...	0 6	0 1 3	1 9	...	...
Cradock ..	0 9 6	...	...	...	...	...	0 8 0	0 6 9	0 12 0	0 0 6	...	0 9	0 1 3	1 11		...
Dordrecht ...	0 12 6	0 15 6	0 12 6	0 9 0	0 10 0	0 12 0	0 10 0	0 7 6	0 12 0	0 1 0	0 10	0 9	0 0 9	2 6	£15	22/6
East London ...	0 13 0	0 15 6	0 13 0	0 7 0	0 10 6	0 9 0	0 11 6	0 7 0	0 13 0	0 1 6	1 1	1 0	0 1 6	2 6	£22	36/-
Graaff-Reinet ...	0 10 6	0 15 6	0 12 6	0 8 0	...	0 9 0	0 9 0	0 7 "	0 12 6	0 0 6	0 7	0 7	0 1 7	2 0	£13	23/-
Graham's Town	0 9 0	...	...	0 9 0	...	0 7 0	...	0 5 6	0 15 6	...	0 9¼	0 8¼	0 2 2	2 6	..	...
Kimberley ..	0 10 0	0 15 6	0 13 0	0 7 0	0 7 0	0 7 0	0 6 6	0 5 9	0 15 0	0 0 6	0 10	0 8	0 1 6	1 6	£13 to £15	20/- to 26/
King Wm's Town	0 8 0	0 8 6	0 12 0	0 7 6	0 7 0	0 7 0	0 9 0	0 6 0	0 9 0	0 0 9	0 9	0 9	0 1 0	2 6	...	...
Malmesbury ..	0 8 6	0 12 6	0 10 6	0 6 3	...	0 7 6	0 7 0	0 3 3	0 8 4	0 1 0	0 8	0 9	0 1 3	1 6	£16	24/-
Mossel Bay ...	0 10 0	0 15 0	0 18 0	0 8 0	...	0 4 0	0 6 0	0 2 6	0 8 0	0 1 0	0 9	0 9	0 1 6	1 6	...	...
Port Alfred ..	0 12 0	0 18 0	0 15 0	0 10 0	0 10 0	0 8 0	0 9 0	0 4 0	0 14 0	0 0 9	0 10	0 10	0 2 0	2 0	...	...
Port Elizabeth ...	...	...	...	0 7 6	...	0 7 6	...	0 4 6	0 15 0	...	0 6	0 7½	0 1 9	2 6	..	...
Queen's Town ...	0 8 6	0 17 6	0 11 3	0 6 6	0 8 9	0 7 3	0 7	0 7 6	0 12 6	0 1 9	0 9	0 9	0 1 3	2 6	£15	20/-
Tarkastad ..	0 12 0	0 13 6	0 12 6	0 12 0	0 12 0	0 11 0	..	0 8 6	0 10 0	0 1 6	0 8	0 8	0 1 3	2 0	£15	22/6
Vryburg ..	0 11 6	0 17 6		...	.	0 12 0	0 9 0	0 7 6	0 14 0	.	...	.	0 1 6	1 3	£17	25/
Worcester ...	0 10 0	0 15 6	0 10 9	0 10 0	0 12 0	0 8 0	0 6 8	0 4 0	0 8 0	0 1 0	0 8	0 7	0 1 6	1 6	...	...

NOTE.—A blank space denotes " no transactions.'

DEPARTMENTAL NOTICES.

Inspection of Live Stock arriving by Sea.

(Proclamations 173 and 75 of 1900 and 214 of 1903).

Regulations for the inspection of Horses, Cattle, and Pigs arriving from abroad are published for the guidance of both Exporters and Importers, to prevent disappointment upon arrival in this Colony.

HORSES, MULES, OR ASSES (Proclamation No 173 of 1900).—Glanders.—(1) No horses, mules or asses shall be allowed to enter this Colony by sea, until they have been examined by an Officer, authorised by the Government, to make examinations under the provisions of the "Animal Diseases Act, No. 27 of 1893," and certified by him to be free from Glanders, or any other infectious or contagious disease.

(2) Should the Examining Officer detect the presence of Glanders in any of the animals on board, all such infected animals shall be immediately killed, and their carcasses taken out to sea, sufficiently and properly weighted, and thrown overboard at a place indicated by the Port authorities.

(3) The remaining portion of any such shipment shall be allowed to be landed only on condition that they are removed to a quarantine station, approved of by the Government, and there subjected to a test with mallein by a duly qualified Officer, under direction of a Government Veterinary Surgeon, and detained for such further period as may be necessary.

(4) In the event of the test indicating the existence of Glanders, all animals so shown to be affected shall also be destroyed.

(5) All expenses of inspection, quarantine, destruction, and otherwise, shall be borne by the owner of such animals.

CATTLE (Proclamation No. 75 of 1900).—Tuberculosis.—1. The word "cattle" in these Regulations shall be taken to mean and include all animals of the bovine tribe.

2. No cattle shall be allowed to enter this Colony by sea until the conditions set forth in these Regulations are complied with.

3. If there shall be produced to the Officer authorised by the Government to make the necessary examination of cattle under the provisions of the Animal Diseases Act No. 27 of 1893, a certificate signed by a duly qualified Veterinary Surgeon of the country from which such animals have been brought, to the effect that they have, before being embarked, been submitted to the test known as the tuberculin test, and have not given any reaction indicative of the presence of tuberculosis, and if upon examination the Government Officer shall have reason to believe that they are free from any contagious or infectious disease he shall forthwith give a permit for their landing at any port or place in this Colony.

4. In the absence of a satisfactory certificate as aforesaid the cattle shall be removed to a place provided by the Government for quarantine purposes, and shall be subjected by a Government Veterinary Surgeon to the necessary testing by tuberculin to ascertain whether they are or are not affected with tuberculosis.

5. In the event of the test indicating the existence of Tuberculosis, the animals shall not be removed alive from the quarantine station but shall be destroyed there, and the owner shall be allowed to deal with the carcasses as he may think fit, provided, however, that the flesh shall not be used for human consumption unless the said officer gives a certificate that it is fit for that purpose.

6 All expenses of inspection, quarantine, destruction, and otherwise shall be borne by the owner of such cattle.

7. The foregoing Regulations shall not apply to cattle entering by sea from the Colony of Natal, so long as similar regulations remain in force in that Colony, nor shall they apply to cattle imported solely for purposes of slaughter, provided that, before being landed, they shall be inspected by the officer referred to in the third section of these Regulations and declared to the best of his belief to be not unfit for human consumption, and the owner or importer shall sign and deliver to such officer an undertaking to the effect that none of such animals shall be used or disposed of for any other purpose than for *immediate* slaughter for food.

8. Cattle arriving from Argentina must be landed at Cape Town and besides the Tuberculin Certificate referred to above must be accompanied by certificate that they have not come from a Redwater Area, besides which they are subject to four days quarantine at the Docks.

PIGS (Proclamation 214 of 1903).—The importation of pigs referred to in this Proclamation shall be permitted only upon the following conditions being complied with, namely:—

(*a*) Before shipment every owner shall obtain a Certificate from a duly qualified Veterinary Surgeon, setting forth that at the time of shipment the pigs are apparently free from the appearance of any contagious or infectious disease.

(*b*) The consignor shall sign a declaration on oath before a competent legal authority in the country from which export is to take place, to the effect that the pigs have been on the premises from which they are removed, prior to being moved for shipment, for at least 14 days, and that during such period no other pig has been introduced or received into or upon such premises, that the pigs are not affected with swine-fever, that they are not moved out of a swine-fever infected place or area, and further that the movement is not prohibited by any provision of law then in force in the country, state or territory from which such movement takes place.

(*c*) The Certificate and declaration hereinbefore referred to shall be delivered to any person authorised by the Government of the Colony of the Cape of Good Hope to make the examination required by the "Animal Diseases Act, No. 27 of 1893."

d) Pigs which may arrive at any port or place in this Colony unaccompanied by the abovementioned certificate and declaration, will not be permitted to be landed, except at Cape Town, Port Elizabeth and East London, where arrangements for quarantine exist.

(*e*) Such quarantine as is in the foregoing section referred to shall not be for a less period than 28 days from the date of embarkation.

(*f*) Pigs, which may be found to be infected with swine-fever on arriving at any Port or place in the Colony, or which have been in contact during the voyage with pigs so affected, shall be dealt with in such manner as the Government may direct.

Swine Fever.

In view of the appearance of Infectious Swine Fever the symptoms of the disease are hereunder described for general information.

Any case coming to the notice of the Public should be at once communicated to the Resident Magistrate of the District in which the disease has occurred.

SYMPTOMS.

The symptoms of swine fever are not very distinct or specially characteristic at the commencement of the attack, or even during its course, except in acute cases.

The affected animals present a dull and dejected appearance; they move about very quietly, and manifest a strong tendency to huddle together. If there is loose soil, manure, or litter available, they will crowd together in that.

Their appetite is diminished, and although many of them continue to take a fair amount of food, until they become very bad, they eat in a languid and indifferent manner. Their temperature rises from about 105 to 106 degrees Fahrenheit. In one the temperature registered was 108·4, but it was hustled about a good deal in catching it, which may have raised its temperature a little.

The breathing is slightly quickened, but the increase in the respirations depends upon the extent of the lung lesions. There is also a cough, which is very much aggravated when the pigs are driven about in a kraal In many cases the cough is the first indication of the infection. There is a hoarseness about the voice in advanced cases.

In an acute attack the pigs fall off in condition very rapidly, and manifest a weakness about the hind quarters which makes them walk with a wobbling staggering gait. As the disease advances the listlessness increases and the hind quarters may become semi-paralysed.

The bowels are usually slightly constipated at the commencement, but diarrhœa generally supervenes towards the end.

The progress of the disease is very variable; in some acute cases it runs its course in two or three days, terminating fatally, while in others it may last much longer, but there has not been sufficient time to speak definitely of the course of the disease here yet.

In a number of cases there is more or less of a pink red discolouration of the skin. This does not usually occur until the disease is at its height, and in many cases there is no appearance of discolouration of the skin observable. When present the parts most affected are under the surface of the neck, the breast and the abdomen; the inside of the thighs and the ears. In acute cases these patches of discolouration extend and coalesce and assume a darker hue, the whole surface of the skin being more or less affected. In such cases the skin after death assumes a dark livid hue.

REMOVAL OF SWINE FROM THE DISTRICTS OF CAPE, STELLENBOSCH, PAARL AND MALMESBURY.

(Proclamation 181 of 1904).

By proclamation No. 181, of June 10, 1904, swine are allowed to be removed out of the above divisions provided a permit for such removal be first obtained from the Chief Veterinary Surgeon.

Prohibition and Regulation of the Introduction of Live Stock in consequence of African Coast Fever in the Transvaal.

(Proclamation 202 of 1904).

By proclamation No. 202, dated June 29, 1904, the following is enacted:—

It shall not be lawful, from and after the promulgation hereof, to introduce or cause or allow to be introduced into this Colony from any part of the Transvaal any of the following animals, that is to say:—Cattle, horses, mules, asses, sheep, goats, pigs, ostriches, dogs and cats; provided, however, that horses, mules, asses, dogs and cats, may, with the special permission of the Chief Veterinary Surgeon, or his authorised representative, be so introduced at such ports of entry as may from time to time be appointed for this purpose, if accompanied by a Certificate signed by the Principal Veterinary Surgeon of the Transvaal, or his authorised representative, to the effect that they have not come from or passed through any portion of the Transvaal proclaimed or known to be infected with African Coast Fever.

Any person introducing such animals or causing or allowing such animals to be introduced, or permitting such animals to stray into this Colony from the Transvaal shall be deemed to be guilty of contravening the provisions of the Proclamation and be liable to the penalties provided in Act 23, of 1893 (Animal Diseases Act, 1893); and all such animals entering the Colony from the Transvaal in contravention of the Proclamation are liable to be destroyed.

Introduction of Livestock into the Orange River Colony from Cape Colony.

The undermentioned Revised Regulations governing the introduction of Livestock from the Cape Colony into the Orange River Colony, through the proclaimed ports of entry, are published for general information.

Duncan Hutcheon,
Chief Veterinary Surgeon.

Cape Town, February 23, 1905.

REGULATIONS.

1. Orange River Colony Proclamation No 52, dated 15th January, 1904, and Proclamation No 3 of 1904, dated 3rd February, prohibit the introduction of any horse, gelding, mare, colt, filly, donkey, mule, bull, ox, cow, heifer, calf, sheep, goat, or ostrich into the Orange River Colony, unless the owner shall have first obtained a certificate as hereunder set forth.

2. The certificate necessary before any of the above mentioned animals can be permitted to enter the Orange River Colony is that set forth in Annexure "A" hereto, issued and signed by the Resident Magistrate, Justice of the Peace, Field-cornet, Veterinary Officer or Inspector of Sheep of the District in the Cape Colony from which such animals have come.

3. The person in charge of such animals is liable to be called upon to produce the certificate aforesaid to the Inspector of Stock at any of the Ports of Entry mentioned in Annexure "B" hereto, or any Justice of the Peace, Police Officer, or owner of land over which such animals may pass or be passing.

ANNEXURE "A."

I,............................ do hereby certify that the animals herein specified (horse, gelding, mare, colt, filly, donkey, mule, bull, ox, cow heifer, calf, sheep, goat, or ostrich) are free from infectious or contagious disease, and have not been in contact with infected animals, and to the best of my knowledge and belief have not come from or through a locality where any such disease is known to exist, viz. :—

Number and general description..
Place from which sent..
Owner's Name and Address..

Name of Person in charge..

Place in Orange River Colony to which animals are sent........................

Signature of Resident Magistrate, Justice of the Peace, Field-cornet, Veterinary Surgeon or Inspector of Sheep of the District in the Cape Colony from which such animals have come..

Place..

Date..

ANNEXURE "B."

Ports of Entry :—

1. Frere Bridge.
2. Colesberg Bridge.
3. Bethulie Bridge.
4. Norval's Pont Bridge.

Proclamation No. 17, 1904 adds :—

5. The farm "Karee Laagte," in the District of Jacobsdal.
6. The farm "Rietpan," in the District of Boshof.
7. The farm "Dalton's Pont," on the farm "Welgedraai," in the District of Fauresmith.

PIGS.

The introduction of Pigs into the Orange River Colony from Cape Colony is prohibited, except pigs imported to Cape Colony by sea, which may be introduced into the Orange River Colony, provided that

(*a*) Such pigs are conveyed direct from the port of landing to the Orange River Colony in closed trucks, such trucks having been properly disinfected at the port of landing ; and

(*b*) A certificate, signed by a qualified Veterinary Surgeon at the port of landing that such pigs were landed free from disease, and that the trucks in which they are conveyed were properly disinfected, accompanies such consignment and is produced at the Border Station.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice in Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from a contagious or infectious disorder, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and, in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to the Chief Veterinary Surgeon, Cape Town (telegraphic address: "Veterinus," Cape Town), the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the treatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residences or nearest Railway or Post Cart Station.

D. HUTCHEON,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 17th March, 1905.

Stations	*Names of Veterinary Surgeons.*
Cape Town	W. G. Pakeman, M.R.C.V.S.
"	P. X. Kearney, M.R.C.V.S.
East London	R. W. Dixon, M.R.C.V.S.
Elsenberg	R. Paine, M R.C.V.S.
Grahamstown	T. Bowhill, F.R.C.V S.
Kokstad	W. A. Hutchence, M.R.C.V.S.
Molteno	J. F. L. Lyons, M.R.C.V.S.
Mossel Bay	J. A. Robinson, M.R.C.V.S.
Somerset East	J. D. Borthwick, M R.C.V.S.
"	J. Spreull, M R.C.V.S.
Uitenhage	G. W. Freer, M.R.C.V.S.
Various	C. Goundry, M R C.V.S.
Vryburg	J. Neill M.R C.V.S.
Worcester	A. Goodall, M.R.C.V.S.

Australian Salt Bush Seed.

It is notified for the information of Agriculturists that about 800 lbs. of Salt Bush Seed recently imported by this Department from New South Wales may be obtained in quantities to suit purchasers at 1s. 9d. per lb. (being one-half the cost of importation) upon application to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received, and must be accompanied by a remittance to cover cost (either Bank Draft, Postal Note, P.O. order or Cash.)

Tobacco Seed.

A small consignment of the undermentioned varieties of Tobacco Seed has been received from America, and is available for disposal, at the prices quoted :—

White Burley, Virginia One Sucker, Virginia Pryor, Blue Pryor and Maryland at 6d. per oz.

Connecticut Seed Leaf at 4d. per oz.

Sumatra at 1/7 per oz.

The seed will be distributed in lots not exceeding 3 oz. of each variety, and applications, accompanied by a remittance for the amount due, must be addressed to the Under Secretary for Agriculture, Cape Town. Applications will be dealt with in the order in which they are received.

Locust Birds.

In view of the ravages caused by Locusts from time to time, the attention of the Public is called to the necessity for protecting and encouraging the birds known as the Great and Small Locust Birds in all parts of the Colony. These birds are of great use to the Agriculturist, seeing that they prey so largely on locusts and other destructive insects which would otherwise leave the land bare of crops and pasturage.

It must be borne in mind that these birds may not be killed as they are specially protected by Law in all parts of the Colony up to and including 5th February, 1906 (Proclamation No. 44 of 1903), and any person wilfully destroying them is liable to fine or imprisonment.

The attention of Field-cornets, Headmen and of farmers generally is drawn to this matter, and it is urgently desired that everyone will do his best to see that the Locust bird is not shot or molested in any way.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d.); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); †Dairy and its Products by D. Hutcheon (2d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); †Hessian Fly (1d.); Insect Pests, their Origin and Means of Suppression (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwûrmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Legislation to exclude Plant Pests (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d.): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); Fumigation for Scale Insects (1d.); The Codling Moth: Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); *Gas Treatment for Scale Insects (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Natural Enemies of the Fruit Fly (3d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); Cyanide Gas Fumigation (1d.); The Fruit Moth (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d); The Olive at the Cape (2d); Tomatoes and Fruit for Export (3d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d); Netting for Fruit Trees (1d.)

Veterinary and Animal Industry.

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and their treatment (1s.); Horse Sickness (2d.); *Heartwater (1d); *Liver Disease among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); Wool v. Mohair (1d); †International Conference of Sheep Breeders (1d.); The Eye and its Diseases (1d): Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d); Persian Sheep and Heartwater (1d); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d); African Coast Fever with Description of Dipping Tank (3d.); Notes on the so-called Paralysis Tick (1d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d. —*coloured plates*.

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d). The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d); Failure of Vines 1d)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.; Transvaal Plant Import Regulations (1d.)

NOTE —All those marked with * are obtainable in Dutch and English.

† Dutch only.

THE PRODUCE MARKET

CAPE TOWN.

Mr. R. Müller reports for the month ending March 20th, 1905:—

Wool.—Since writing you last, several sales have taken place at which competition was fairly good. In view, however, of the London sales showing a decline of 5 per cent., prices on our market are easier. Roggevelds offered were sold at 7¾d. Good Karoos brought 6⅝d. Calvinias, 6¾d. per lb. A few lots of Lambs Wool were offered and realised from 6d. to 7½d. per lb, Some Snow Whites were offered, and a parcel of Extra Super Paarl was declared not sold at 1s. 8½d. per lb. Super Snow Whites may be quoted at from 1s. 5d. to 1s 6½d. Seconds at from 1s. 1d. to 1s. 4d. per lb.

	s.	d.	s.	d.
Super Long Grass Veld Wool	0	8	0	9
Super Long Karroo Veld Wool	0	6¾	0	7¾
Medium Karroo Veld Wool	0	5	0	6

	s.	d.	s.	d.
Short and Inferior ..	0	4	0	5
Wool for Washing ..	0	4½	0	6
Snow-white Super to Extra	1	5	1	9
,, Ordinary	1	2	1	5
Fleece Washed ..	0	9	0	10

Ostrich Feathers.—Some very decent parcels have come forward and where they showed good quality good competition has not been wanting, the rates being fully maintained. Common quality, pluckings, and heavy stalky goods do not show much competition.

	£	s.	d.	£	s.	d.
Super Primes	10	10	0	35	0	0
Firsts, Ordinary to Super ..	8	0	0	10	10	0
Seconds ..	6	0	0	7	0	0
Thirds ..	3	10	0	5	0	0
Femina (super)	7	0	0	10	0	0
Femina, Seconds to Firsts ..	4	0	0	6	0	0
Byocks (fancy) ..	5	0	0	7	10	0
Long Blacks ..	4	10	0	7	10	0
Medium Blacks	3	0	0	3	10	0
Short to Medium	0	10	0	2	10	0

	£	s.	d.	£	s.	d.
Floss ..	0	5	0	1	10	0
Long Drabs ..	2	10	0	4	10	0
Medium Drabs..	1	5	0	1	15	0
Short to Medium	0	10	0	1	10	0
Floss ..	0	2	6	1	10	0
White Tails ..	1	5	0	1	15	0
Coloured Tails..	0	5	0	1	10	0
Chicks ..	0	1	0	0	2	0
Spadonas ..	0	10	0	4	0	0
Inferior Black & Drabs, Short to Long ..	0	0	6	1	10	0

Mohair.—Only odd lots are arriving, which are sold at current rates; prices showing no change.

	s.	d.	s.	d.
Mohair, Firsts, Summer	0	10	0	11¾
,, Kids.. ..	1	3½	1	4
,, Seconds ..	0	6½	0	9¾

	s.	d.	s.	d.
Mohair Winter ..	0	10	0	10¾
,, ,, Kids..	1	0	1	2

Hides and Skins.—On the last London sales Sheep Skins were in good demand; prices ruled from par to ¼ decline; while Coarse Wooled Skins fetched full prices.

In our market all classes are in good demand.

	s.	d.	s.	d
Long Wool Skins ..	0	6	0	6½
Short ,, ..	0	5	0	5¾
Shorn ,, ..	0	4½	0	5
Bastards	0	4½	0	5
Cape Skins .. each	2	0	2	1

	s.	d.	s.	d.
Cape Skins cut each	0	0	1	0
Goat Skins, heavy to light	0	8¼	0	10
Sundried	0	0	0	6½
Angoras	0	4½	0	5½

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date March 18:—

Ostrich Feathers.—The market was only moderately supplied this week with a fair average assortment. On Monday the tone of the market was rather weak and undecided, but on Tuesday competition was more active, and last week's prices were fully maintained. The next London sales open on the 3rd proximo. The total quantity sold on the public market this week amounted to £3,448 14s. 4d., and weighed 1,781 lbs. 1¼ ozs.

	£	s.	d.	£	s.	d.
Primes : Extra super				Special Prices.		
Good to super	10	0	0	12	0	0
Whites : Firsts .	6	10	0	9	0	0
Seconds ..	4	10	0	5	10	0
Thirds ..	2	10	0	4	10	0
Feminas : Tipped and Grey ..	5	0	0	7	10	0
Seconds ..	2	5	0	4	0	0
Thirds ..	1	7	6	2	5	0
Fancy ..	4	5	0	6	10	0
Tails : White ..	1	7	6	2	10	0
Light ..	1	0	0	1	10	0
Coloured & Dark	0	5	0	0	15	0

	£	s.	d.	£	s.	d.
Blacks : Long ..	3	5	0	5	0	0
Medium ..	1	7	6	2	12	6
Short ..	0	10	0	1	0	0
Wirey ..	0	1	0	0	1	6
Floss ..	0	6	0	1	1	0
Drabs : Long ..	1	12	6	3	0	0
Medium ..	0	15	0	1	7	6
Short ..	0	2	6	0	6	0
Wirey ..	0	0	6	0	1	0
Floss ..	0	6	0	1	1	0
Spadonas : Light	1	0	0	3	0	0
Dark ..	0	12	6	1	12	6
Chicks ..	0	0	3	0	1	6

Wool.—This market remains depressed, and the amount of business done in the open market during the week has been small, our sales of 500 bales being the most important. There is some enquiry for good light short grease, for which full prices are paid. On the public market yesterday a large quantity was offered, chiefly made up of heavy and wasty parcels, for which there was little or no demand, the bulk being withdrawn at low bids.

Snowwhite Extra Superior ..	17½d	19d
Snowwhite Superior ..	16d	17d
Do Good to Superior	14½d	15½d
Do Inferior Faulty	13¼d	14d
Grease, Super Long, well-conditioned, Grassveld grown, special clips	7d	8d
Grease, Super Long, well-conditioned, Grassveld grown ..	6¼d	7d
Grease, Super Long, well-conditioned Karoo Grown ..	6d	6½d
Grease, Super Long, well-conditioned, Mixed Veld ..	5¾d	6½d
Grease, Light, faultless, medium, Grassveld grown.. ..	5¾d	6¼d
Grease, Light, faultless, medium Karroo grown	5¼d	5¾d

Grease, Light, faultless, short Karroo grown	4¾d	5d
Grease, Short, faulty and wasty ..	4½d	4¾d
Grease, Coarse and Coloured ..	4½d	
Scoured, Coarse and Coloured ..	6½d	10½d
Free State Grassveld Grease, long and well-conditioned ..	6d	6¼d
Free State medium grown, light, with little fault ..	5¼d	5½d
Free State short, faulty and wasty ..	4½d	5d
Free State Karroo grown, long and well-conditioned ..	5¼d	5¾d
Free State medium grown, light, with little fault ..	5d	5½d
Free State short, faulty and wasty ..	4½d	4¾d

MOHAIR.—There is nothing new to report in this market. The only arrivals are oddments, which are sold at current rates. On the public market on Tuesday a small quantity was offered, and prices showed no change. We would strongly recommend farmers to allow their hair to grow to its full length, as from what we can learn the demand will run more on length than on fineness of quality.

Kids, superfine ..	1s 4¼d	1s 6d
Kids, ordinary ..	1s 2½d	1s 3d
Kids, seedy and mixed	0s 9½d	1s 0d
Superior Firsts ..	None offering.	
Ordinary Firsts ..	None offering.	
Long Blue O.R.C. Hair	None offering.	

Mixed Hair ..	0s 9½d	0s 10¾d
Seconds and Grey ..	0s 7d	0s 8½d
Thirds	0s 4½d	0s 4¾d
Winter	0s 11d	0s 11¼d
Do. Kids ..	1s 0d	1s 1d

Skins.—Sheepskins sold in bundles at 6½d per lb.; Pelts at 4d; Capes, 1s 6d; damaged, 6d each; Angoras, 5¾d Shorn, 4½d; damaged, 2¾d; Goat, 10½d; damaged, 5¼d per lb; Springbok, 8d each.

Hides.—Sun-dried Hides sold this week at 7¾d, and for damaged, 6d; Drysalted 7d damaged, 5¾d, and Thirds, 3½d.

Horns.—Parcels all round sold at 3½d each.

THE

Agricultural Journal

OF THE CAPE OF GOOD HOPE.

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Advertising Charges.—Approved advertisements are accepted for this Journal at the following rates per issue :—Full page, £2 ; three-quarter page, £1 10s. ; half page, £1 ; quarter page, 10s. Subject to a discount of 10 per cent. if the order covers six or more consecutive issues. The rates for the Dutch issue are similar, with no extra charge for translation.

All communications should be addressed :
"The Editor, Agricultural Journal, Department of Agriculture, Capetown."
Telegraphic Address : "Bulletin," Capetown.

CONTENTS.

PAGE.
NOTES— 634—640
To Correspondents—Fruit Growers' Congress—Oudtshoorn Fruit Growers—Dr. Purvis's Heartwater Vaccine—Wool and its Preparation for the Market—Hanepoot on Aramon Rupestris—Cotton Growing—Cape Fruit in London—The South African Stud Book—Introduction of Cattle from Cape to the Transvaal—Horticultural Assistant's Tour.
FARM AND VELD—(*Illustrated*)— 641—646
On Irrigation—Sluit Prevention—Lining Boreholes—A Remedy for Snails—Method in Orcharding—Irrigation Queries—The Points of Persian Sheep—Treatment of Wire-worm in Sheep.
PREVENTIVE VACCINE FOR HEART-WATER ... ... 647—648
EXTRA-TROPICAL FORESTRY, by D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town ... ... 649—662
THE VALUE OF CACTUS ON DRY LANDS ... ... 663—665
LUNG WORM IN SHEEP ... ... 666—669
RURAL CAPE COLONY, No. XII., by F. D. MacDermott (*Illustrated*) ... ... 670—678
COTTON GROWING IN CAPE COLONY, by Arthur H. Roworth ... ... 679—685
ALBANY AGRICULTURAL SOCIETY. The 1905 Show (*Illustrated*) ... ... 685—693
PORT ELIZABETH AGRICULTURAL SOCIETY. THE 1905 SHOW (*Illustrated*) ... ... 694—706
THE MARKETING OF FRUIT, WINE, VEGETABLES, &c. ... ... 707—713
BONE MEAL FOR CATTLE ... ... 714—715
REVIEWS ... ... 715—716
CORRESPONDENCE (*Illustrated*)— 717—728
Cattle Dipping Tanks—Sluits and Dongas—Lifting Water for Irrigation—Surface *vs.* Artesian Waters—The Hippopotamus in the Colony—"Vrot-pootjes" in Onions—Bird Guano—Weirs Across Streams—Land Measurement—Measuring the Flow of Streams—Hairball in Calves—The Eradication of Scab—Mr. W. R. Southey Scheme—Lime and Sulphur Dip—Still Lime and Sulphur—Cold Storage of Fruit—Destruction of Lynx (Red Cat)—Lifting Water for Irrigation.
RURAL REPORTS ... ... 729—731
NOTES ON THE WEATHER OF MARCH, 1905 ... ... 732—735
RAINFALL RETURNS FOR MARCH, 1905 ... ... 736—738
DEPARTMENTAL NOTICES ... ... 739—740
DEPARTMENTAL PUBLICATIONS ... ... 741—742
THE PRODUCE MARKET ... ... 743—744
INDEX TO ADVERTISERS ... ... lxvix—lxx

NOTES.

To Correspondents.

We again have to crave the indulgence of many correspondents whose letters are held over from the current issue. Any that do not appear this month will be published in the next number. While on this subject we would again remind correspondents that it is next to impossible to insert letters or contributions in the forthcoming issue if received after the 20th of the month. The work of printing, binding and preparing for the post is now a task of some magnitude involving a great deal of labour, therefore we have to allow sufficient time if the publication is to appear regularly on the first of each month.

Fruit Growers' Congress.

A general congress of fruit growers—the annual function for the Western and South Western Districts—is to assemble in Oudtshoorn on the 16th of this month and will probably extend over the 17th and 18th. The hope has been expressed that the Eastern Province will join in, and it is anticipated that some delegates at least will attend, but we have heard nothing, as yet, as to any definite arrangement for the joint congress so earnestly desired by the whole of the Western growers and many of the Eastern growers. It was suggested at the last congress of the Eastern Province growers held at East London, and an understanding was arrived at, that an endeavour would be made to bring the representatives of the two sections together. We trust this is being done, for there are many issues which might be settled by a round table conference at which a spirit of compromise engendered by personal contact generally does much towards smoothing over difficulties. Even the much debated codlin moth trouble is not insurmountable—not to mention other questions which distance tends to magnify.

Oudtshoorn Fruit Growers.

The Oudtshoorn Fruit Growers' Association has changed its name and with the change has taken on wider and more important functions. It is to be known in the future as the Oudtshoorn Farmers' and Fruit Growers' Association and we trust that it may flourish and prosper in the wider sphere of action indicated. Excellent work has been done in the past by the old association, but Oudtshoorn is not all fruit and it is high time the very important agricultural industries of that district were organised and represented. The new departure should have the effect of bringing in the general farmer and agriculturist and thus accomplish a work of the greatest value to all concerned. Such organisations cannot be too highly valued for they open the way to illimitable possibilities. Co-operation, the great need of the whole of our farming community, can only come through organisation and a spirit of mutual confidence, and it is to such institutions as this, supported by voluntary effort, that we must look for the ultimate development of that spirit. It is also pleasing to note that Mr. F. Muller Rex who has so successfully kept the old society together has been appointed secretary to the new organisation.

Dr Purvis's Heartwater Vaccine.

We print in this issue the result to date of the experimental trial of Dr. Purvis's vaccine against Heartwater. It seems that the veld infection was particularly mild last season, as only four out of ten controls succumbed to the disease, and working with sheep it seems rather injudicious and liable to lead to error to quote percentages with such small data. Four dead out of ten is certainly 40 per cent. death rate, just as one out of two would be 50 per cent. In this respect the experiment is indecisive, the proper test would be for some farmers to adopt it on a larger scale. And as one Farmers' Association at least has already expressed its confidence in the efficacy of Dr. Purvis's method of inoculation, there should be no difficulty in getting such an arrangement carried out.

Wool and its Preparation for the Market.

Messrs. A. Mosenthal & Co., of Port Elizabeth, have just published a little pamphlet on the above subject which should set the wool-growers of the Colony thinking. It deals more particularly with an aspect of the Cape wool trade, which is causing some anxiety among the better-informed of the produce dealers of the Eastern Province, and that is the increasing quantities of heavily yolked wools which are coming forward season after season. It should be scarcely necessary to labour the argument that the wool-buyer wants wool and not grease, and if he is forced to accept too large a proportion of the latter commodity he regulates his prices in accordance. But what is not generally known is that America has been one of our best customers in time past for superior light clips and that owing to the growing tendency noted, this market is closing against us. American buyers must have the best because of the heavy duties they have to pay, viz., 5½d. per lb., on grease wool. They cannot afford to ship much grease and dirt on that tariff.

Hanepoot on Aramon Rupestris.

In connection with the preliminary notice of the sale of vines at Tokai in July, Mr. C. Mayer, Secretary to the Western Province Horticultural Board, writes to warn farmers against purchasing the Hanepoot grafted on Aramon Rupestris, as it can only lead to disaster. Some years ago, he says, attention was drawn to the fact that Hanepoot on Aramon Rupestris is a distinct failure, the vines living only four to five years. In spite of this, he continues, we find a

Government institution grafting such and offering them for sale. If the Tokai authorities depended upon the advice of the officers of the Agricultural Department in regard to this, they were clearly misled, for any vine-grower of experience of the past and present could quote numerous instances where Hanepoot on Aramon Rupestris absolutely failed. It is, in fact, taking the general experience into consideration, inadvisable to use any Rupestris stock for Hanepoot, but recommended to depend upon the stock which has so far given satisfaction.

Cotton Growing.

Cotton as a possible crop in Cape Colony is the subject of frequent letters to the Department from farmers and others who suggest that it may have a great future with us, or at least be worth an extended trial. We are now able to announce that arrangements have been made with the British Cotton Growers' Association for obtaining a supply of seed, and any one who cares to make a trial will be supplied with a small quantity of seed of several different sorts for experiment. The seed is now under order. Some information on the subject will be found in an article we publish in this issue from the pen of Mr. Arthur H. Roworth of Cape Town, an authority on cotton, and the local representative of the British Cotton Growers' Association. The paper may be commended to the serious attention of those meditating a trial of cotton as a crop. It may be mentioned that several attempts have been made at cotton growing at the Cape, particularly along the South East coast where cotton has grown well, but in every case the difficulty of harvesting and marketing has proved a stumbling block. If after the preliminary experiments have shown whether, and to what extent, cotton can be grown at a profit, and what methods of cultivation succeed best here, the Association will come forward, as we understand they are prepared to do, and aid us in the arduous task of marketing, a practical solution of the difficulty may be achieved and perhaps a new staple export discovered. We sincerely trust that such may be the case. We understand that Messrs. Parker, Wood & Co., of Port Elizabeth are also distributing small supplies of Peterkin cotton seed through the Port Elizabeth Agricultural Society to all who wish to try it. At the recent show a sample of cotton and of the plants grown by Mr. Geo. Brown were exhibited which attracted considerable attention and constitutes we understand the first exhibit of the kind in South Africa. The late Mr. S. Cawood tried many years ago to encourage the propagation of cotton in Lower Albany, but we do not know if he ever succeeded in procuring sufficient of the local product to make an exhibit.

Cape Fruit in London.

The reports to hand of the Exhibition of Cape Fruit in London at the Show organised by the Royal Horticultural Society are very satisfactory so far. The fruit exporters' agents (Messrs. G. E. Hudson & Son) took the matter in hand and report that with the energetic and kind help of Mr. Lewis Atkinson, they were able to make the Cape Fruit exhibit one of the best, if not the best, of Colonial Fruit, and were fortunate in securing Awards for nearly every exhibit, including the Society's Gold Medal. The magnificent collection of Pears and Apples sent over by the Cape Orchard Company saved the situation; had it not been for this, the exhibit of South African Fruit, as a whole, would have been a very small one. Other Shippers such as the Rhodes Fruit Farms: Meerlust Fruit Farm, Mr. O. C. M. Barry, &c., &c., sent fine samples, but a very small quantity and very few varieties as compared with the C.O C. Each individual Shipper's Fruit was exhibited separately under his or their own name, and, in addition one exhibit was made under the heading of the Fruit Exporters' Association. The Exhibition table was tastefully decorated with Palms, Cape Heath, &c., this added largely to the general effect, and from the numerous applications and the praise that is being bestowed on the Fruit, there is every reason to believe that growers and shippers will be satisfied with future results. Messrs. Hudson were disappointed in not receiving any consignments of Canned or Bottled Fruit, Dried Fruit or Jam. These would have added largely to the importance of the exhibit.

The Royal Horticultural Society has published the following report on the Show:—"At the second show of Colonial Fruit held by this Society, which opened yesterday (Wednesday), there was a much finer exhibition than was the case in December last. The date was fixed for the end of March in compliance with requests to that effect which had been received from the Cape, and the fruit exhibited by that Colony was a revelation of the perfection both in which it can be grown and in which it can be delivered in this Country. The collection of the exhibits and other work were undertaken by the Fruit Exporters' Association of South Africa, acting in conjunction with the Western Province Agricultural Society, whose joint collection of Cape Fruit was awarded a Silver-gilt Banksian Medal. Among the other exhibits staged by them were some magnificent Apples, Pears, and other Fruits sent by the Cape Orchard Company, which were awarded the Gold Medal of the Society, the Pears being the best ever yet sent from the Cape. The Rhodes Fruit Farm Company were awarded a Silver-gilt Knightian Medal for a similar exhibit. The Meerlust Fruit Farm were awarded a Silver-gilt Banksian Medal as an extra prize for the excellence of their Jonathan Apples and Plums. Mrs. Hawkins, of Cape Town, was awarded a Silver Medal for her exhibit of Grapes; and it is encouraging to notice from the exhibits shown, that Cape growers are this year beginning to send over Grapes which have been thinned when young, and the fruit is, in consequence, enormously improved in value. Silver Banksian Medals were awarded to the Agent-General for the Cape for his exhibit of Bottled Fruits, which had, we learn, been bottled for over seven years, and yet were as good now as then. Similar awards for Cape fruit were made to Mr. T. Micklem and to Mr. O. Barry, both for Pears. The results of these exhibits should not only make the horticultural possibilities of the Cape better known to us English, but should stimulate and encourage the growers to grow and despatch more and more Fruit, which is specially welcome on our markets at the present season of the year, when home-grown supplies are practically exhausted."

The South African Stud Book.

The manuscript Stud Book of the Cape Section of the South African Stud Book writes the Secretary of the Cape Stud Breeders' Association) was opened on the 20th of March. Since then 430 entries have been made, consisting of Horned Cattle of the following breeds: Jerseys, Freislands, Shorthorns, Herefords, Ayrshires, Red Polled Suffolk, Lincolnshire Red Shorthorns and Black Welsh. *Horses*—Clevelands, Clydesdales, and Hackneys. Sheep—Merino Sheep and Persian Sheep, and Angora Goats. Ostriches and many more stock would have been entered, but the important and necessary work of deciding upon a more or less uniform standard for each class is of necessity taking time. Breeders, however, are earnestly engaged in the work, which by the way is no easy matter or light undertaking; but it is anticipated that the next issue of the *Agricultural Journal* will see a great deal accomplished in the matter of standards. There has been a most satisfactory addition to the members' roll, forty-one joining since I last wrote you, nearly all being stock breeders, many of whose stock were exhibited at the recent Agricultural Shows (amongst which were many prize winners). Others are breeders who have not been exhibitors, while some who are not stock owners, have joined because, it is believed, the movement is capable of doing the country much good, and they, therefore, support it. Of course there are, comparatively speaking, only a few who really have had the opportunity of considering thoroughly the almost limitless scope for good work that lies within the bounds of this Association. But the support already given leads to the conclusion that stock owners have faith in this Association as being the means of greatly encouraging the breeding of the best stock.

The writer is convinced that the Association's connection with the other Colonies of South Africa will give an opportunity for writing a list of registered stock, and the names of their enterprising owners in letters large enough to span from the Zambezi to Table Mountain, consequently, even those residing in out-of-the-way corners of South Africa may know where to obtain good stock—should they require fresh blood of a pure type for their flocks and herds—with little trouble, compared with the old state of things. No condemnation, however, is passed upon the good old times, because it must be conceded that the past methods of stock breeding suited those times, but we now find that things are rapidly changing.

Almost every part of the stock-raising world is pushing its stock into our midst—offering them as superior to Colonial bred—as sires and slaughter stock. This alone makes it high time, talented Colonial breeders had greater facilities and opportunity of proving that we possess much stock as good as we can import, and, where this is not the case, to encourage the needed improvement. The work of giving facilities for proving the excellent quality of much of our stock, and making improvements where that is needed, is being done by the Stud Book Association as fast as time will permit.

The following are the members of the Registration Board, who were elected at the inaugurative meeting:—C. G. Lee, President; Mr. P. Michau, Vice-President; Messrs. J. Rawbone, Broadlands, Sir Lowry's Pass; R. Pell Edmonds, Ripplemead, Kubusi; Hilton Barber, Halesowen; E R. Hobson, Fair View, Aberdeen Road; O. E. G. Evans, Melrose, Bedford, and Harold Abrahamson, who was Honorary Secretary for the Board, to whom the thanks of the Association are due for his able help. The Registration Board's Executive consists of three members, Messrs. R. Pell Edmonds, J. Rawbone and C. G. Lee. Inspectors for Merino Sheep, Persian Sheep, Angora Goats and Afrikander cattle have been appointed and stock committees for each class of stock have been appointed.

It is anticipated that East Griqualand will be worked through a Sub-Committee appointed by the Registration Board with certain administrative powers. The necessity for this arises, because of the long distance this very important territory is situated from the Association's head office, and the want of direct railway communication.

The Orange River Colony and Transvaal have each formed their sections of the Stud Book and it is believed, that within the coming month these two Colonies with the Cape, will appoint the Stud Book Central Council who are responsible for the keeping of the South African Stud Book, compiled from the entries taken from each Colony's manuscript book who also have the appointing of the Editing Committee and the publication of the Stud Book volumes for each class of stock.

The Natal Government has given substantial financial aid towards its own section of the Stud Book and with their advanced farming there can be no doubt that the Central Council will soon be made the richer and wiser by members on the Council from that progressive Colony. Rhodesia has—as far as I can gather—spirited and enterprising breeders ready to advocate their Colony taking its place in the Stud Book scheme. This gap will remain until they take a share in this important work and occupy their seat at the "round table" Council of the South African Stud Book scheme. It is self-evident that none but Rhodesians can successfully occupy this Section.

The pastoral interests of South Africa, are great, the assets in live stock most valuable, and nothing short of a very powerful organization is absolutely necessary, whose special duty it is, and whose present interest it ever will be, to watch over, protect, and advance this great industry. Spread over the greater portion of the sub-continent such an organization will be in existence in the South African Stud Book Association

Introduction of Cattle from Cape to the Transvaal.

Advice has been received from the Agricultural Department of the Transvaal that no cattle will be admitted into that Colony without a permit, previously obtained from that Department. In all cases, therefore, where it is proposed to send cattle into the Transvaal, application should first be made to the Director of Agriculture, Pretoria, stating the name and address of the applicant, the number of cattle to be sent forward, the station in the Transvaal to which the cattle will be trucked, and their further destination, giving name of farm and district. Upon receipt of such details an early reply may be expected.

Horticultural Assistant's Tour.

The Horticultural Assistant of the Department of Agriculture (Mr. E. Pillans) will be starting on his annual tour about the end of the current month (May). Fruit growers and Fruit Growers' Associations, who may wish to consult him, should communicate direct, fixing an approximate date. A letter addressed to the Horticultural Assistant, Department of Agriculture, Cape Town, will be sufficient.

FARM AND VELD.

On Irrigation (*Continued.*)

"Apex" writes:—"While we are waiting for them, let us consider where we ought to begin irrigation works. At the source of the rivers. The banks are lower here. The small sums we have to spend will pay for low 'diversion' weirs (the cheapest form of irrigation works, giving the largest return on the least outlay) There is a more rapid fall in these valleys, making the furrows shallower and shorter; the water is generally from grass clad hills and seldom has that plastic silt which makes our lands almost waterproof after a year or two of flooding, and we must not forget, that in diverting the streams at their source, we are contributing towards a permanent stream lower down; for the river owes its course to its being the natural drainage channel of the surrounding area. In turning out floods we impound, as it were, so much of them in a large but unwalled tank, out of which a considerable portion will drain back in weeks or months to its natural channel, the river-bed; the balance going to strengthen springs perhaps. In reducing the volume of floods we are making things easier for the irrigators lower down stream who will follow our example. They will have less flood water to contend with, and can make their weirs higher, without the floods getting round the ends and washing out the banks. It gives shallower furrows (those who have tried a deep one will appreciate this), and they get more ground under water, and some day when the rivers are fully weired and there is still water running to the sea we shall ask a paternal Government to construct 'impounding' weirs and reservoirs to stop this waste, and admit of irrigation between the rainy seasons. This conserved water will be distributed by the local irrigation committee who, as before stated, will have entire charge of the working (a cheaper and better method this, arranging distribution of all waters among ourselves, than each fighting our case in the law courts; and let us remark that on some American rivers after irrigators have, almost to a man, gone to law over their water rights and a good many of them got ruined in the process, they have eventually combined and gone in for local control).

"These conserving weirs and reservoirs may not pay—in many countries they do not—but if they give crops in between floods and enable us to supply our own markets with meat, butter and vegetables, and so circulate the money among ourselves instead of sending it abroad for them, they will still be worth doing, and it will be the duty of the state to construct them, for the public good. Each man working a small irrigation farm is one more man added to the number of those who will take an intelligent interest in larger irrigation schemes and help to supply the data which are absolutely necessary to ensure the big works being a complete success. We must remember that contributions of clear water from each irrigated farm will much reduce the proportion of silt in the floods lower down; where we shall sometimes find natural sites for conserving the surplus. Ideal irrigation will give the land only just enough for the growth of the particular crops sown, there would be none to return to the stream; but in most callings in life we require practice before we arrive at ideal conditions, and irrigation will prove no exception to this rule, so that for the present we may rely on lower owners benefiting by irrigation above them, as practice in this country and America has already shewn to be the case and if eventually we can be classed as ideal irrigators returning nothing to the river, how much more ground shall we then have water for than at the start.

"What shall we grow under irrigation? Lucerne must be our chief crop. Once established and three years old, it is there for many a season; it suits our cheapest form of irrigation works (diversion weirs), for it will stand five months and more, we know, without water, and the instant the flood comes it is growing. It still thrives after many years of slightly brack water in spite of great neglect of cultivation. We get from six to eight crops in the year in warm districts with ample flooding and with some little trouble in subsoiling and cultivation, there are few soils it will not grow in. There is no better hay for winter use. Our ostriches grow the finest feathers on it, and, as Mr. Oscar Evans puts it (Transvaal *Agricultural Journal*), we can ride many thousand pounds worth of feathers to market on the back of a Cape cart (no railways required for this purpose). Sheep fatten on it in an incredibly short time, and in our dry districts, most months in average years, there is plenty of thin stock to be fattened on it and driven to market, a wagon load of hay accompanying them if distances are great (here, too, no railway is necessary). Wheat we hear mentioned as our chief irrigation crop, and railways to be built to ride it away with. In this country, speaking generally, wheat under irrigation is a luxury few of us can afford, and experience will teach us this, if we must each gain it for ourselves before we believe, though of course there are areas with heavy and shallow soils which would yield well in wheat, but be poor lucerne lands. However, they are generally the exception rather than the rule. Can we compete with the small man in foreign lands, who, with the help of his family, does all the work without expense, sowing when the land is thoroughly soaked by winter rains, and when the necessary spring showers are almost a certainty, paying next to no rent, in many cases working a free grant of virgin soil, sending long distances by sea, 'tis true, but how ridiculously cheap is water carriage for such cargoes? Lucerne should be the chief irrigation plant of the Cape Colony, and in it are our largest profits with least labour."

Sluit Prevention.

In connection with the prevention of the formation of sluits, Mr. L. C. French, of Elands Height, Maclear, forwards a tuft of grass, which, he says, is abundant in that district and grows strongly where the veld is heavily fed down, and also in and across footpaths when they are not too quickly formed or too much used. It is, he thinks, by far the most valuable local native grass for the prevention of denudation and the formation of sluits. He has seen no mention made of such a grass in the correspondence *re* sluit formation and prevention, and would be obliged if we could give any information as to the value of the grass, its name, etc. From the nature of the climate and veld, he thinks the grass would only be of value in moderately wet climates, *e.g.* it might be of value at Indwe and in the Transkei. The grass is much appreciated by stock of all sorts and would not harm the veld as some of the native deep-rooted grasses would, as they are coarse and therefore neglected by stock.

It is difficult to identify a grass from a wilted tuft of leaves, but from the general appearance it reminds the Government Botanist (Prof. MacOwan) of the so-called "Rooi grass"—*Anthistiria ciliata*, Retz.—about which particulars have been published in the *Agricultural Journal* and republished in the Agricultural Miscellanea. Should this guess be correct it is the most valuable grass the Cape possesses, as every veld farmer knows. To make quite sure, our correspondent should send a specimen in full flower; it can then be identified.

Lining Boreholes.

Mr. A. O. Skeen, of Tygersfontein, district Riversdale, raises a question that is of interest to a good many farmers now that so much boring is being taken in hand. He says:—"Having strong reasons to believe that there is subterranean water upon my property, I sank a well 37 feet deep, but the work being too slow and not being in a position to hire the Government drill I hired a 3-inch jumper bore. The well I sank is in a blue slate-stone, and, judging from the formation of the surrounding country, I have reason to believe that the same stone continues to a great depth. Under these circumstances I take the liberty of asking your very valuable advice. Will you kindly let me know whether, considering that the borehole will be in the solid rock, you think it will be absolutely necessary to sink a 3-inch pipe-casing down with the bore. The rock is very solid and not likely to cave in.

In order to get an authoritative opinion on the point we referred the letter to the Chief Inspector of Boring, who replied: "If the borehole is sufficiently solid for it to stand alone, without pieces falling from its sides, it will be quite unnecessary to line it."

A Remedy for Snails.

Mr. Wm. Inglis, of Observatory, in a letter to the Acting Secretary for Agriculture, offers the following suggestion for getting rid of snails:—During the occupation of the Cycle Track by the Boer prisoners, large quantities of snails accumulated amongst the surrounding enclosed trees and shrubbery. After the camp was broken up a number of ducks belonging to the tenant of the house adjoining—the old race-stand—went in and soon cleared off the snails. If farmers, therefore will drive flocks of ducks over infested ground they will soon find the snails removed with great benefit to the ducks. Possibly the great increase of snails on the Green Point Common is due to the draining of the vlei, which has driven many thousands of sea-fowl away from a favourite feeding and resting place.

Method in Orcharding

Mr. H. Cloete, of Herbert's Hope, Bedford, writes:—I notice in the Rural Reports for Bedford for the month ending March 15 the report says: "Fruit bad on account of drought." Now, I would just like to make a remark on this. I planted an orchard about three years ago, according to Mr. Pillans's instructions, and I certainly had more fruit this year and the finest that I have ever seen, large, and free from maggot. I'm quite sure that if others in the Bedford district planted an orchard on the same system and carried out Mr. Pillans's instructions, they would reap the same results.

Irrigation Queries.

In reply to Mr. D. B. Menne's queries, which appeared in the April number of the *Agricultural Journal*, Mr. W. R. Southey supplies the following:—

1. The thickness of masonry wall depends upon its height, the base should be half that of its height, the base of a 12 feet wall should be 6 feet.

2. My weirs are perpendicular, built what is called on the batter, that is, sloping down towards upstream. This is done by prising the stones from the back, so as to give a slope of about 6 in. in four feet, the object of this is strength to resist pressure, the pressure tending downwards and the force of water not so liable to tilt over the top stones. The depth of water being greater at lower end of slope than that at the top is a preventive to stones being knocked off by floating stumps of wood coming down in flood Where weirs silt it is a good plan to have a set off every three feet inside of from four to six inches, according to height of weir; it is a saving of cost and labour, the silt settling on the ledges, answering the same purpose as filling up with masonry, the weir before silting up would have the appearance of a stair-case, on the inside; where there is no silting I would build solid, with a slope running up to four feet at the top.

3. Size of sluice at No. 1 weir, four feet wide, six feet high, thickness of plate, ¼th of an inch.

4. For all smaller sluices I would recommend ¼ inch plates.

5. All my sluices are of the same pattern as in No. 1 weir, made to lead out of the wall in the same way.

The Points of Persian Sheep.

In reply to "Enquirer" *re* the points of Persian Sheep, Mr. Hougham Abrahamson writes:—I hope the following points will be of some use, as it is intended that they will be used in judging a Persian for entry into the South African Stud Book:

1. The head and neck to be of a black colour, the black running evenly round, bag under neck to be large and hanging.
2. Tail, broad, deep, and square, well upon back, not in a downward or hanging position; the second joint of tail not too large or coarse, and to be set firmly against the main tail in a backward position, the top being about on a level with the back, the third point to hand perpendicularly, and not coarse.
3. The bare skin visible behind the tail quite black.
4. Symmetry, back broad, deep at girth, good brisket, short straight legs.
5. Weight.
6. Strong smooth coat, and without wool.

Horns, wool, and black on body disqualify.

Any further information can be had from Mr. C. G. Lee, Sec. South African Stud Book, Klipplaat Station.

Treatment of Wire-worm in Sheep.

Mr. H. M. S. Bastard, writing from Ficksburg, O.R.C., says:—I dosed a flock of 400 sheep, (which were suffering from wire-worm) with bluestone, following the directions given by Mr. Hutcheon C.V.S., No. 3, Vol. XXIV of the *Agricultural Journal*, namely: 1 pound of bluestone dissolved in 7 gallons of water, giving lambs six months old 1½ oz., two to four-toothed sheep 3 oz., and old ewes 4 oz. The sheep were fasted 25 hours before dosing, and the time taken in dosing was 4 hours making the fast for the last sheep 29 hours. The sheep were allowed to graze as soon as they were dosed, but were not allowed to get to water. In the evening the sheep were kraaled, apparently well, but next morning three were found dead, and three more sick, which died during the day in spite of dosing each with two teaspoons of Laudanum mixed with milk. All the rest were feeding and appeared well, but on the second day after dosing, 6 more got sick, these I also dosed with Laudanum but two died, the other four recovered. The *post-mortem* appearance was the same in every case, the fourth stomach being empty and inflamed, the intestines were also inflamed—the inflammation apparently being the cause of death. I would therefore be glad if Mr. Hutcheon could give a reason for these sheep dying, and advise as to the best course to adopt in future, as, should I dose according to the above named directions, I again lay myself out to lose, and if I make the solution weaker, or fast the sheep for a shorter period it may not be effective.

This letter was referred to Mr. Hutcheon, C.V.S., who supplies the following valuable memorandum on the subject:—In reply to Mr. Bastard's communication on the dosing of sheep with bluestone solution for wire-worm (*Strongylus contortus*) in the fourth stomach, I have to state that since writing the directions which Mr. Bastard refers to, I have gradually increased the *quantity* of the bluestone mixture given as a dose, but reduced its strength, especially for lambs and young sheep, whose stomachs are more delicate than full-grown animals. It should be borne in mind that it is not the quantity of the bluestone which is given as a dose which is dangerous; it is the *strength* of the solution which is apt to cause inflammation of the stomach when it is empty. I find that if the solution is made weaker, you can then give a larger dose of bluestone with safety. When one pound of bluestone is dissolved in seven gallons of water—42 bottlefuls—each fluid ounce of the mixture contains about seven grains of bluestone,—that makes 28 grains in the 4 ounces,—which is the dose for a full-grown sheep. If 1lb. of bluestone is dissolved in 50 bottlefuls of water, each ounce of the mixture contains about six grains, and 1 lb. to 60 bottles, contains about 5 grains to the ounce. In practice, it will be found safer and better to give five ounces of the solution containing six grains to the ounce, than four ounces of the solution containing seven grains, although the sheep gets two grains more of bluestone. The same remarks apply to giving six ounces of the solution containing five grains to the ounce. But this strength of the solution should be given to lambs and young sheep only. Some little time ago, I dosed a small flock of lambs about five months old with a mixture made of 1 lb. of bluestone in 72 bottles of water. I gave each lamb four ounces of the mixture, which would be about 17 grains of bluestone. The lambs were in very poor condition and I was afraid of killing any of them. The dose was repeated in 14 days. The lambs did not suffer from the dosing, but improved rapidly in condition.

PREVENTIVE VACCINE FOR HEART-WATER

DR. PURVIS'S METHODS

By D. Hutcheon, M.R.C.V.S., Chief Veterinary Srgeon.

Dr. Carrington Purvis, Grahamstown, who claims to be in possession of a vaccine with which sheep and goats can be rendered immune to the disease of Heart-water, has been afforded an opportunity, by the Veterinary Branch of the Agricultural Department, to demonstrate its practical utility. The district chosen was in the Eastern Province, near Somerset East, and the experiment was conducted under the supervision of Veterinary Surgeon J. Spreull, M.R.C.V.S., whose reports on the result obtained are published for general information.

Re Dr. Purvis's Experiment.

To D. Hutcheon, Esq., Colonial Veterinary Surgeon.

Sir,—In compliance with your request, I have the honour to forward to you particulars of Dr. Purvis's Heart-water Experiment up to date.

The sheep employed were Merino Hamels, mostly 2-4 tooth and some were older. Forty were inoculated and ten left as controls. On 16/12/03 the first vaccine was injected. On 16/1/04 the second vaccine was injected. On 9/2/04 the sheep were placed on infected veld at "Klein Jaskraal," district Somerset East.

They remained there till 5/11/04 or, roughly, nine months. The following casualties occurred there :—

One inoculated sheep destroyed by Jackals.
One inoculated sheep died of Jagziegte.
13/5/04. One control sheep died from Heart-water.
27/5/04. One control sheep sick from Heart-water(?) and recovered.
26/6/04. One control sheep sick from Heart-water for four days and recovered.
4/7/04. One inoculated sheep a few days sick from Heart-water, killed by Jackals.
25/8/04. One inoculated sheep two days sick from Heart-water, killed by Jackals..
2/9/04. One inoculated sheep 24 hours sick and died from Heart-water.

The veld infection at Klein Jaskraal proving rather feeble, the sheep were moved to Hoekoe, near Bushman's River Station, arriving there on November 7th, and they have remained there up to date of writing.

The following are the further casualties :—

29/11/04. One control sheep two days sick, died Heartwater.
29/11/04. One inoculated sheep sick severely. but recovered.

29/11/04. One inoculated sheep sick mildly.
11/12/04. One inoculated sheep sick and recovered.
11/12/04. One control sheep sick and died on 14/12/04.
17/12/04. One inoculated sheep sick and recovered.
17/12/04. One control sheep sick and died 19/12/04.
27/12/04. One inoculated sheep sick and recovered.
30/1/05. One inoculated sheep sick and died Heartwater.
10/2/05. One inoculated sheep sick and died Heartwater.
10/2/05. One control sheep sick and died Heartwater.
18/2/05. One inoculated sheep sick and recovered.
24/2/05. One inoculated sheep died, but *not* from Heartwater.

In the nine months during which these sheep sojourned at "Klein Jaskraal" Mr. Botha lost only six (6) sheep and eight (8) goats amongst his own flock of 1,200 sheep (mostly crossbreds) and 250 goats Boer and Angora, whilst very few others sickened from Heartwater.

At Hoekoe Mr. Slater has a flock of about 200 head most of which are Boer Goats, and during this summer he has had very few cases of Heartwater only a few kids having died.—I have, &c., &c.

(Signed) J. SPREULL, M.R.C.V.S.

Veterinary Surgeon Spreull again reports on the 3rd April, amending certain of the figures in his Report of the 15th March:—

"Since March 15th, when my last Report was written three sheep have been sick from Heartwater all recovering; one was a *control* and the other two were *inoculated* sheep, one of the latter having a very severe sickness as it lay in the kraal for over twenty-four hours. I counted the flock and much to my surprise found six controls alive out of thirty-seven sheep remaining.

"Mr. Slater cannot account for the error, but admits that he must have made a mistake and reported a control dead when it could only have been an inoculated animal."

It will be seen that Mr. Spreull accounts for three Inoculated animals as having succumbed to Heartwater, the fourth is the sheep mistaken for a Control.

As we wish to give the method the benefit of every doubt we will eliminate from the inoculated list of dead, the two sick sheep which were killed by jackals.

The final tally will therefore read:—
that of the 40 inoculated sheep—
*11 or 27·5 per cent. were sick.
† { 4 or 10·0 „ were sick and died.
5 or 12·5 „ were sick but recovered.
2 or 5·0 „ were sick but were killed by Jackals;
while of the 10 controls—
*6 or 60 per cent. were sick.
† { 4 or 40 per cent. were sick and died.
2 or 20 „ were sick but recovered.

† included in *

EXTRA TROPICAL FORESTRY.

(*Continued from page 527*).

By D. E. Hutchins, F.R. Met. Soc., Conservator of Forests,
Cape Town.

TREES SUITABLE FOR THE VARIOUS CLIMATES OF SOUTH AFRICA.

In South Africa one encounters very diverse climates. There is the semi-tropical climate of the north-east coast with its warm sea current and great south-east air current, there is the temperate south European climate of the south-west coast with its Mediterranean climate, there is the cool equable climate of the western seaboard with its cold antarctic sea-current. Inland there are cold plateaux rising to elevations of between 4,000 and 5,000 feet (nearly 6,000 at Johannesburg) with summer rains and climates generally like that of Mexico; there is the Kalahari Desert, the semi-desert Karroo and the fertile Eastern highlands of Cape Colony, and the cooler and more fertile highlands of the Transkei. There are rainfalls ranging from nothing to 100 inches a year. For tree-planting purposes I have divided the country into fourteen climatic zones, besides the desert and the drier parts of the Karroo where trees will only grow when watered either by irrigation or the subsoil moisture of their situation.

In addition to the desert and the fourteen climatic zones, there is what we must consider as another tree-planting climate, namely, the cool and moist indigenous evergreen forest. This forest is found either (like the forests of dry southern California) in sheltered kloofs, or occupying the cool damp southern sides of the coast mountains. In general appearance it is remarkably like the Sholas of the Nilgiris in Southern India, though it contains larger trees than these. It is also like in appearance, though the trees are inferior in size, to the "Brush" forests of East Australia and the heavy evergreen forest on the Western Ghauts of India. The indigenous evergreen forest of South Africa, with Yellow-wood, Stinkwood, Sneezewood, Assegai, Ironwood and various so-called "Pears" as its chief forest species, extends from the kloofs of Table Mountain to the north-east of the Transvaal, with little alteration in character. Nor is there a very great difference in effective climate, though the forest extends from the winter rainfall of the Cape Peninsula far into the summer rainfalls of Natal and the Transvaal. The small difference in the moisture conditions is owing to the fact that in the South-west of Cape Colony the dry summers are mitigated by the forest being entirely confined to damp kloofs and mountain gorges, and by the inherent moisture-conserving power of the forest itself. It is only in the all-the-year-round rainfall of Knysna that the forest spreads out into any extensive unbroken areas. Beyond Knysna in the summer rainfall areas the forest is less continuous and becomes dependent for winter moisture on occasional storms, on misty weather at intervals, and here too again on its inherent moisture-conserving powers. Here once more the forest is only seen in situations where the moisture conditions are most favourable. The actual rainfall in the forest belt varies from 30 to 100 inches, and averages about 40 inches. In the long journey from Cape Town to the North-east Transvaal the forest belt maintains the same mean temperature—about 60 degrees Fah.—by rising in altitude as the latitude decreases.

The present area of this belt of indigenous evergreen forest is computed at 473,373 acres, of which 362,373 are in Cape Colony.

The following is a fairly complete list of the trees found in the indigenous Yellow-wood forest. It includes several which are not found in the dense forest proper, but which skirt its edges and occur where the dense forest has been partially destroyed. Other species are found extremely rarely in the dense Yellow-wood forest. Thus, I know of only one locality where *Callitris cupressoides* occurs, and it is possible that this may turn out on further investigation to be another species of Callitris. From this list are excluded trees which grow only in the open scrub forest of the coast, and trees which form more or less open forest by themselves, such as *Leucadendron argenteum*, the Silver Tree of the Cape Peninsula, *Callitris arborea*, the Cedar of the Cedarberg, and *Callitris schwarzii* (*Marloth*) the Cedar of the Kouga Mountains. The semi-tropical trees of the Transkeian coast found at elevations below 2000 ft. are also excluded, though Yellow-wood trees, favoured by the heavy rainfall of the Pondoland coast, are found amongst them, particularly in the Egosa forest. The only trees of much practical timber value in the Yellow-wood forest proper are the following:—

The Two Yellow-woods

Stinkwood
Sneezewood
Assegai
White Pear
Black Ironwood
White "
Wild Olive
Kafir Plum
Cape Box
Kamasi

and of these trees only the Yellow-woods and sometimes Black Ironwood grow to a size large enough to supply timber for house or bridge building. Other trees are occasionally worked, often in substitution for these, or under special circumstances, such as being better grown or more abundant than usual.

It is doubtful if any indigenous tree is sufficiently valuable and fast-growing to warrant its being planted in preference to one or other of the picked trees of the larger forest floras of other extra-tropical countries, which grow to perfection in the favourable climatic conditions found in the South African Yellow-wood region.

TREES OF THE INDIGENOUS YELLOW-WOOD FOREST.

Botanical Name.	*Common Name.*
Apodytes dimidiata	White Pear
Bersama tysoniana	Bastard Sneezewood
Brachylæna discolor	
Burchellia capensis	Wild Pomegranate
Buxus macowani	Cape Box
Buddlea salviæfolia	Sagewood
Callitris cupressoides	Berg Cypress
„ natalensis (Endlicher) ?	Natal Cypress
Calodendron capense	Wild Chestnut
Cathastrum capensis (Pleurostylia)	Mountain Hard Pear
Celastrus (Gymnosporia) acuminatus	Silkbark
Celastrus (Gymnosporia) buxifolius	
Celastrus (Gymnosporia) peduncularis	
Celastrus (Gymnosporia) undatus	
Celtis kraussiana	Umcumvu
„ rhamnifolia	Camdeboo Stinkwood
Clausena inæqualis	Umnacambile
Colpoon compressum	Cape Sumach
Combretum erythrophyllum	Umdubu
„ salicifolium	„
Cryptocarya sp.	Umtungwa
„ acuminata	
Cunonia capensis	Red Els
Curtisia faginea	Assegai
Cussonia sp.	Cabbage Wood
Dovyalis rhamnoides	Wineberry
Ekebergia capensis	Essen wood
„ meyeri	„
Elæodendron capense	Saffraan
„ croceum	
„ velutinum	

Botanical Name.	*Common Name.*
Erythrina caffra	Kaffir boom
„ latissima	
Euclea lanceolata	Bush Gwarri
„ daphnoides	
„ pseudebenus	Cape Ebony
Eugenia cordata	Waterboom
„ zeyheri	Isiduli
Faurea saligna	Terblanz
Ficus sp.	Mkwane
Garcinia gerrardi	Ebony
Gardenia globosa	Umsugusu
„ rothmannia	Candlewood
Gonioma kamassi	Kamassi
Grewia occidentalis	
Greyia sutherlandi	Kruisbesje
Halleria lucida	Kinderbesje
„ eliptica	Wild Fuschia or Natseng
Hibiscus tiliaceus	Tree Hibiscus
Hippobromus alata	Paardepis
Ilex capensis	Wit hout
Kiggelaria dregeana	Wild Peach or Natal Mahogany
Kraussia lanceolata	Umdhlesa
Lachnostylis capensis	Coalwood
Milletia caffra	Umzimbit
Mimusops obovata	Red Milkwood
Myrsine melanophleos	Cape Beech
Nuxia congesta	Bogwood
„ floribunda	Vlier
Ochna arborea	Cape Plane
Ocotea bullata	Stinkwood
Odina caffra Harpephyllum caffrum)	Kaffir Plum
Olea foveolata	Ironwood (Small)
„ laurifolia	Black Ironwood
„ verrucosa	Wild Olive
Olinia cymosa	Hard Pear
Pavetta lanceolata	Umdhlesa
Pittosporum viridiflorum	Umkwenkwe
Platylophus trifoliatus	White Els
Plectronia mundtiana	Klip Els
„ obovata (Canthium)	Kwar
„ pauciflora	
„ ventosa	Schaapen drolletjes
Podocarpus elongata	Outeniqua Yellow-wood
„ thunbergii	Upright „
„ thunbergii var. falcata	Natal „
Protea grandiflora	Waa' boom

Botanical Name.	*Common Name.*
Pterocelastrus variabilis	Kerse hout
Pteroxylon utile	Sneezewood
Pygeum africanum	Bitter Almond
Rhus lævigata	Red Currant
„ longifolia	Umkomiso
„ viminalis	Kri
Royena lucida	Swart bast
„ pallens	Onderbosch
Salix capensis	Cape Willow
Schmidelia decipiens	
Schotia latifolia	Boerboon
Scolopia mundtii	Red Pear
„ zeyherii	Thorn Pear
„ ecklonii	Red Pear
Sideroxylon inerme	White Milkwood
Strychnos atherstonei	Kajàtenhout
„ henningsii	Hard Pear
Tarchonanthus camphoratus	Vaal bosch
Toddalia lancelata	White Ironwood
Trema bracteolata	
Trichelia emetica	Natal Essenwood or Mahogany
Trichocladus crinitus	Onderbosch
„ ellipticus	
Trimeria alnifolia	Wild Mulberry
„ trinervia	Vaalbosch (Vaderland's Wilge)
Virgilia capensis	Keur
Weihea madagascariensis	Wild Quince
Xymalos monospora	Wild Lemon
Zanthoxylon capense	Knob Thorn
„ thunbergii	„
Zizyphus mucronata	Buffelsdoorn

The indigenous forest is poorly stocked with timber. The merchantable timber probably does not average more than 6 per cent. of the stock it might carry; and the growth of the indigenous trees is slow. We see the same characteristics in the indigenous forest of the Nilgiris and of the extra-tropical forest on the mountains of the West Indies, of Mauritius, and of other localities. Much of the unproductive forest of these weak isolated forest floras has been re-inforced by the casual introduction of stronger members of larger forest floras. Hence the importance of introducing the best exotic timbers to the indigenous forest of South Africa. And the climatic conditions in the South African forest belt are so favourable that there is almost the whole world of the extra-tropics to choose from. The South African indigenous forest is now composed of damp-loving and shade-bearing species that refuse to grow when planted away from the shade and shelter of their own surroundings; but which, by virtue of their shade-bearing qualities, propagate themselves and grow where there is not sufficient light for most of the introduced species.

Of the introduced species, the two that, from the value of their timber and their shade-bearing qualities, are perhaps the best adapted for planting and spreading themselves in the ever-green indigenous forest are, *Cinnamomum camphora* or the common Camphor tree, and *Cedrela toona* var *australis*, or the red Cedar of East Australia. Not quite so shade-bearing and therefore more adapted to the glades and half shaded openings in the indigenous forest are *Acacia melanoxylon* or the Blackwood of Australasia, and *Sequoia sempervirens*, the Redwood of California, the most valuable and largest timber tree on our globe. These last two are better suited to the higher wetter glades.

I cite these trees as being peculiarly valuable for timber and which have proved themselves adapted to planting in and improving the indigenous forest. There in a flourishing plantation of Camphor in the historical old Grootvaders Bosch in the Swellendam District, which was taken over in a nearly ruined condition by the Forest Department a few years ago and is now being restored by replanting and protection. As regards seed of these four trees, *Cedrala toona* is very difficult to obtain good. Camphor is not easy to obtain in abundance and soon goes bad; Californian Redwood is costly and of inferior quality; while Blackwood is obtainable everywhere and of first rate germinative quality.

Whatever be the delay, on account of want of funds, in planting these trees extensively in the indigenous forest, it is a matter of prime importance to plant at once a sufficient number of trees for test purposes and seed in the future, i.e., *at selected forest stations throughout the forest, there should be special planting for seed and testing purposes of Camphor, of Australian Cedar, of Californian Redwood, and of Blackwood.*

In addition to these four species numerous other valuable species will suggest themselves to the student of trees as adapted to planting in and near the indigenous forest. Particularly are there many valuable trees in the so-called "Brush" forests of East Australia (*vide* below under Forests of New South Wales), in the Southern Brazilian forest of Rio Grande do Sul and in the southern extra-tropical forests of Japan. Not many pines grow well in the damp evergreen forest, but *Pinus khasya* does so grow in the extra-tropical highlands of the Shan States, and it is worthy of particular trial here, in the summer rainfall portion of the South African indigenous forest belt.

The essential is to introduce first rate timber trees with such a strong natural reproduction that they will extend themselves self-sown and re-inforce the poor stocking of the indigenous Yellow-wood forest, which, in spite of its beauty, and the noble trees it contains, gives now but a poor return in timber for the well-watered region it occupies.

CLIMATIC TREE-PLANTING ZONES.

The following list of South African climates and of trees suited to them are intended to assist tree-planters; but it will be understood that on account of the restricted operations of the Forest Department, they are necessarily not complete. The climatic regions must be taken in a general sense, though they are probably sufficiently detailed for most tree-planting operations.

Omitting desert areas with a yearly rainfall below 10 inches I have divided South Africa into the following fourteen climatic zones:—

(1) South-western coast and coast mountains—Cape Peninsula, Ceres, Drakenstein, etc.
(2) Cedarberg country.
(3) South-western coast drier than No. 1—Malmesbury, Caledon Bredasdorp, etc.
(4) South-western inland—Worcester, Robertson, Oudtshoorn.
(5) Lower Karroo.
(6) Upper Karroo and Orangia.
(7) Knysna.
(8) Eastern coast—Uitenhage to St. John's.
(9) Eastern mid-elevations.
(10) Eastern Highlands.
(11) Natal coast and semi-tropics.
(12) Middle Districts, Natal.
(13) Transvaal and upper districts of Natal.
(14) Rhodesia.

CAPE PENINSULA AND SOUTH WEST.

1. *Western fertile coast districts with winter rainfall of from 20 to 60 inches: Ceres, Drakenstein, Cape Peninsula, and along the coast range to Swellendam. Snow on the mountains at intervals during winter, very rarely descending to nearly sea level, occasional frosts from sea level upwards: the climate of the Mediterranean with somewhat less seasonal range of temperature. Mean temperature 60° Fah.*

All the trees of the Mediterranean, of the Southern Californian coast and of Southern Australia from Perth to Sydney Certain trees from North and South America, but these not the most hardy. A very few doubtful trees from Japan, the Himalayas, Asia Minor and South America. Of these trees the following may be looked on as naturalised, taking the Eucalypts and Pines first, as these are the two most important genera as timber trees.

NATURALIZED TREES.

First, let us cite the five species of Eucalypts that are being grown for sleepers. They are the most profitable in that they are quick-growing (about as fast as the Blue-gum) and yield first-rate hardwood timbers:—

Eucalyptus pilularis	Flintwood
,, resinifera	Jarrah-like
,, microcorys	Tallow-wood
,, paniculata	Iron-bark
saligna	Saligna gum

This order represents about their relative value in the south-west of Cape Colony. Other naturalized Eucalypts are :—

Eucalyptus acmenoides	White Mahogany Gum
,, amygdalina	Amygdalina gum
,, botryoides	Botryoides ,,
,, calophylla	Calophylla ,,
,, capitellata	Capitellata Stringy bark
,, coriacea	Coriacea gum
,, cornuta	Yate
,, cornuta var. symphyocarpa	Bushy Cornuta gum
,, corynocalyx	Sugar-gum
,, corymbosa	Bloodwood
,, diversicolor	Kari
,, eugenoides	Eugenoides Stringy-bark
,, ficifolia	Crimson-flowering gum
,, globulus	Blue-gum
,, gomphocephala	Tuart
,, goniocalyx	Goniocalyx gum
,, gunnii	Gunn's gum
,, leucoxylon	Leucoxylon gum
,, longifolia	Longifolia gum
,, macrorhyncha	Macrorhynca Stringy-bark
,, marginata	Jarrah
,, megacarpa	Megacarpa gum
,, obcordata	Obcordata ,,
,, obliqua	Obliqua Stringy-bark
,, punctata	Punctata gum
,, redunca	Redunca gum or Wandoo
,, rostrata	Rostrata gum
,, rudis	Rudis ,,
,, sideroxylon	Sideroxylon Ironbark
,, tereticornis	Tereticornis gum
,, urnigera	Urnigera ,,
,, viminalis	Viminalis ,,
Pinus canariensis	Canary Island pine
,, halepensis	Jerusalem pine
,, insignis	Insignis pine
,, pinaster (maritima)	Cluster pine
,, ,, var. hamiltoni	Hamilton's Cluster pine
,, pinea	Stone pine
Acacia binervata	Binervata wattle
,, cultriformis	Cultriformis wattle
,, cyclopis	Cyclopis wattle

Acacia decurrens	Black wattle
„ implexa	Implexa ..
„ longifolia	Longifolia wattle
lophantha	Lophantha ..
melanoxylon	Blackwood ..
obliqua	Obliqua wattle
pycnantha	Pycnantha wattle
saligna	Saligna wattle (Port Jackson)
Angophora lanceolata	Angophora
Agonis flexuosa	Willow Myrtle
Alnus glutinosa	Alder
Callistemon rigidus	Bottlebrush
„ salignus	Green bottlebrush
Callitris cupressoides	Berg cypress
Casuarina quadrivalvis	Quadrivalvis beefwood
Colpoon compressum	Cape sumach
Cordyline australis	Cordyline
Cunonia capensis,	Red Els
Cupressus lusitanica	Portuguese cypress
„ goveniana	Goven's „
„ macrocarpa	Macrocarpa cypress
Curtisia faginea	Assegai wood
Ekebergia capensis	Essenhout
Elæodendron croceum	Saffran
Ficus capensis	Cape Fig
Gonioma kamassi	Kamasi
Hakea gibbosa	Thorny Hakea
„ suaveolens	Common „
Juniperus communis	Common juniper
Kiggellaria africana	Wild peach
Leucadendron argenteum	Silver tree
Leptospermum lævigatum	Australian myrtle
Lycium horridum	Cape Box thorn
Melaleuca leucadendron	Paper bark
Myrsine melanophleos	Cape beech
Myoporum insulare	Manotoka
Ocotea bullata	Stinkwood
Olea laurifolia	Black ironwood
„ verrucosa	Wild olive
Olinia cymosa	Hard pear.
Podocarpus elongata	Large yellow-wood
„ thunbergii	Upright „
Populus alba	White poplar
„ fastigiata	Lombardy poplar
„ monilifera	Cottonwood
„ nigra	Black poplar
Quercus ilex	Evergreen oak
Quercus pedunculata	Common oak
Salix alba	Osier
„ caprea	

Salix cinerea	Osier
Sideroxylon inerme	White milkwood
Morus alba	„ mulberry
„ nigra	Black „
Tristania conferta	Tristania (Apple in Australia)
Virgilia capensis	Keur

TREES GROWN WITH SUCCESS.

The following trees have been grown with success under natural conditions. This is not the place to attempt to enumerate those that have been grown artificially, watered and tended in gardens. Many of the trees, even in the following list, are only hardy in certain situations :

Acacia acuminata	Raspberry jam
„ falcata	Falcata wattle
„ horrida	Cape mimosa
„ oswaldii	Oswald's acacia
„ penninervis	Penninervis wattle
„ pruinosa	Pruinosa „
Abietia douglasii var. macrocarpa	Douglas pine of California
Araucaria bidwilli	Bunya-bunya
„ braziliensis	Brazilian araucaria
„ cunninghamii	Cunningham's araucaria
	Norfolk Island pine
„ imbricata	Puzzle monkey
Betula alba	Common birch
Callitris calcarata	Black or Stinkwood Cyress-pine
„ cupressiformis (rhomboidea)	Oyster Bay pine
„ muelleri	Mueller's Cypress-pine
„ propinqua	Kangaroo Island Cypress-pine
„ robusta	White Cypress-pine or camphor
Castanea vesca	Chestnut
Calodendron capense	Cape chestnut
Casuarina suberosa var. leptoclada	Leptoclada beefwood
„ stricta	Beefwood
„ tenuissima	Beefwood
Cedrus deodora	Deodar
Ceratonia siliqua	Carob
Cercis siliquastrum	Judas tree
Cinnamomum camphora	Camphor tree
Cryptomeria japonica	Japanese cedar
Cupressus arizonica	Arizonica Cypress
„ benthamiana	Bentham's cypress
„ guadalupensis	Guadalupe cypress
„ lindleyana	Lindley's cypress
„ sempervirens var. horizontalis	Common cypress (spreading)

Cupressuss empervirens var. pyramidalis	Common cypress (upright)
Eucalyptus bicolor (E. largiflorens)	Bicolor gum
„ citriodora	Lemon-scented gum
„ crebra	Crebra ironbark
„ cordata	Cordata gum
„ cosmophylla	Cosmophylla gum
„ decipiens	Decipiens Gum
„ eximia	Eximia gum or Mountain Bloodwood
„ fissilis	Fissilis gum
„ hæmastoma	Hæmastona gum
„ hemiphloia	Grey box
„ longicornis	Morrell
„ loxopleba	York gum
„ macranda	Macranda gum
„ macrocarpa	Macrocarpa gum
„ maculata	Spotted gum
„ melanophloia	Melanophloia gum
„ melliodora	Melliodora gum
„ microtheca	Microtheca gum
„ muelleriana	Mueller's gum
„ obtusiflora	Obtusiflora gum
„ occidentalis	Occidentalis or mallet bark gum
„ patens	Patens or W. Aust. blackbutt
„ piperita	Piperita gum
„ planchoniana	Planchoniana gum
„ propinqua	Propinqua or Grey gum
„ regnans	Giant gum
„ risdoni	Risdoni gum
„ robusta	Robusta gum
„ rudis	Rudis gum
„ sieberiana	Siberiana gum
„ siderophloia	Siderophloia Ironbark
„ stellulata	Stellulata gum
„ stuartiana	Stuart's gum
„ stricta	Stricta gum
„ trabuti	Trabuti gum
„ trachyphloia	Trachyphloia gum
„ pulverulenta	Pulverulenta gum
„ propinqua	Grey gum
„ virgata	Virgata gum
Ficus macrophylla	Moreton Bay fig
„ natalense	Natal fig
Fraxinus american	American ash
„ excelsior	European ash
„ „ var. kabylia	Kabyl ash
„ ornus	Manna ash
„ velutina	Velutina ash

Gleditschia triacanthos	Gleditschia
Grevillea robusta	Silky oak
Juniperus bermudiana	Bermuda pencil cedar
„ chinensis	Chinese juniper
„ mexicana	Mexican „
„ virginiana	Pencil cedar
Libocedrus decurrens	Incense cedar of California
Ligustrum compactum	Chinese privet
„ japonicum	Japanese privet
Melaleuca preisiana	Preisiana Paper bark
Melia azedarach	Cape Syringa
Odina caffra (Harpephyllum caffrum)	Kaffir plum
Olea europea	European olive
Phœnix dactilyfera	Date palm
Pinus palustris (australis)	Long-leaf pitch pine
„ benthamiana	Bentham's pine
„ contorta	Contorta pine
„ coulteri	Coulter's pine
„ densiflora	Densiflora pine
„ mitis	Mitis „
„ muricata	Muricata „
„ murrayana	Lodgepole „
„ ponderosa	Yellow „
„ sylvestris	Scotch „
„ taeda	Loblolly
„ thunbergii	Japanese Cluster-pine
„ torreyana	Torrey's pine
Pistacia lentiscus	Mastic Tree
„ terebinthus	Terebinth tree
Platanus occidentalis	American Plane tree
„ orientalis	Oriental Plane tree
Quercus alba	White oak
„ ballota	Ballota oak
„ coccifera	Kermes oak
„ cerris	Turkey oak
„ mirbeckii	Algerian oak
„ suber	Cork oak
Robinia pseudacacia	Robinia
Sabal palmetto	Palmetto
Salix amygdalina	Osier
„ capensis	Cape willow
„ purpurea	Osier
„ viminalis	„
„ sp.	„
Schinus molle	Pepper tree
Sequoia sempervirens	Californian Redwood
Sterculia diversifolia	Karajong
„ acerifolia	Flame tree
Syncarpia laurifolia	Turpentine tree

Tamarix gallica	Tamarisk
Taxodium distichum	Bald cypress
Ulmus campestris	Elm—common
Pittosporum undulatum	Pittosporum
Washingtonia filifera	Fan Palm of California

2) THE CEDARBERG COUNTRY.

One hundred and twenty-five miles north of Cape Town and fifty miles from the cold waters of the Atlantic, stretching north and south a distance of 40 miles, lies the stupendous range of the Cedarberg. Topographically, the Cedarberg is simply the lofty broken edge of the western side of the great South African plateau, of which the most notable feature, coming south, is the Great Winterhoek, 6,818 ft. elevation. The Great Winterhoek is the highest mountain in the South-West, the first to put on its winter cap of snow and the last to lose its snow after the passage of a winter storm.

The Cedarberg range is double the height of Table Mountain, and being so little north of Cape Town has in winter one of the most severe climates in South Africa. At the same time, as it is on the verge of a nearly rainless country, the winter precipitation, though still heavy, is much less than on Table Mountain. In summer the climate is absolutely dry. To the east of the Cedarberg lies the parched Karroo; to the west, 50 miles of sandy plain, and then the waters of the Atlantic, which here, owing to the cold Antarctic current, has a mean temperature which averages throughout the year the same as that of the British Channel. In winter violent easterly winds blow off the Karroo and are generally the harbingers of the winter rain storms. These features combine to give the Cedarberg a climate of its own, a climate which resembles in many respects the mountainous climate of the South-west generally, but which, with perfectly dry summers and winters warm at times, and then biting cold, possesses features which are not found elsewhere in the South-west. The rainfall of the Cedarberg varies from 20 to 40 inches, and falls entirely in winter. There are 4 or 5 falls of snow each winter. During winter most of the Cedarberg farmers trek away with their stock to a milder climate.

Strong streams of crystal water fill most of the valleys, streams which are soon lost after they emerge on to the hot sandy plains at the foot of the mountains. Many features in the Cape Cedarsberg recall those of the Atlas and the Sahara; and it is not without a certain fitness that the new Forest Station in the Cedarberg has been called "Algeria." The area declared demarcated forest under the Forest Act embraces an extent of 182 square miles, or 116,495 acres. The Cedar trees are now thinly scattered over this area, occupying rocky localities where they have been able to escape the grass fires. At the present day Cedar trees are not found below the level of the winter snow, but there is evidence that the trees formerly grew at a lower level.

The Cedarberg may be described as a one-tree country. It is the home of the Clanwilliam Cedar (*Callitris arborea*). Full details regarding this remarkable tree will be given later under *Callitris arborea.* It grows to the size of a noble tree with the typical Cedar shape; and was at one time abundant on these mountains. It will be sufficient here to say that it bears a very close resemblance in size and manner of growth to the better known Cedar of the Atlas Mountains (*Cedrus atlantica*). I have read the official accounts of *Cedrus Atlantica* and have scrutinized the photos accompanying the reports of French Forest Officers. The photographs would do as well for the one tree as for the other. Comparing the timbers of the two trees the Clanwilliam Cedar is the more valuable, being much more highly scented and more durable. The peculiar climate of the Cedarberg country is reflected in its Cedar, which, it has been shewn by experiment, will grow nowhere else in South Africa.

Of other trees which may flourish in the Cedarberg country we have unfortunately little knowledge. The operations of the Forest Department have been so sadly curtailed that it has been almost impossible to properly test the other trees which should succeed in this region. One of the first trees to be well tried should naturally be *Cedrus atlantica.* Its growth should be compared with *Callitris arborea.* Sowings of Cluster-pine have been made, to some extent, without much success. Most probably the climate is really too severe for this generally hardy pine. Neither is it possible yet to say how *Pinus canariensis* will succeed. Various trees have been tried for fire-line purposes, the chief work of the Forest Department here being to combat the fires which tend to sweep over the mountains yearly and destroy the Cedar re-growth. For *Acacia melanoxylon* and *Acacia decurrens* the climate seems too dry in summer. Of the Eucalypts tried for fire-line purposes, *Eucalyptus resinifera* seems to be the best. The climate is so peculiar that considerable further experimenting will be necessary before the most suitable fire-line tree can be determined.

The warm valleys of the Cedarberg country with their rainless summers present probably the best fruit-growing region in South Africa. The South-easters of Cape Town and the South-west are here unknown. Oranges have a peculiar sweetness of flavour unknown elsewhere in South Africa, and Orange trees bear enormous crops. Nowhere else are such fine dried peaches produced. The common Oak (*Quercus pedunculata*) planted round some of the farms grows with a vigour rarely seen elsewhere in South Africa. The Dog-rose has run wild and forms occasionally huge masses, the size of a hay-stack. The valleys, however, are narrow, and the cultivable areas small. The Cedar, which grows here and nowhere else in the world, is the chief asset of this wild neglected region. The Clanwilliam Cedar is a long lived tree. A cross section of timber shows sufficiently distinct annual rings, and it is not uncommon, when examining these, to find trees that are 250 or 300 years old.

THE VALUE OF CACTUS ON DRY LANDS.

Mr. Ferdinand Gressert of Harrismith, O.R.C., contributes the following remarks on the above subject. As he wrote in German, we supply a translation:—

In the January number of the *Agricultural Journal* statements are set forth in several essays which apparently contradict one another. On page 121 the planting of *Opuntiæ* is recommended for preventing the formation of ravines, on page 116 the eradication of the *opuntia* is demanded, but one in other districts and of a different kind, viz., the jointed prickly cactus; on page 45 drainage and facilitating of the formation of ravines is recommended and again on page 121, &c., the prevention of ravine-formation by means of dam-construction is desired.

Every thing has two sides and it is the farmer's task to seize upon that side of every phenomenon which is most useful under local conditions.

Professor von Richthofen says of the loess plains (loess is a diluvial deposit of fine loam) of the northern part of the Chinese Empire that they are only opened up by the gradual growing backwards of the rivers. For as the fertile river-valleys gnaw deeper into the country, far less water is lost on the endless plains, on the contrary the water flows together in the valleys and supports in spite of the limitation in area many more people than the wide (salpian ?) steppes did formerly.

For this reason we may console ourselves in South Africa for the increasing deterioration of the grazing country with the fact that the suitability of the country for artificial irrigation grows at the same rate, since an ever greater percentage of the rainfall runs off ever more and more charged with fertile mud. One must, however, take care that level valleys, in every way suited for irrigation, are not rendered unfit for this purpose by the formation of ravines.

The present percentage of water, out of the total rainfall, which reaches the sea is very small in the arid part of South Africa. It is only necessary to compare the estimated volume of water brought down by the Orange River in a year with the enormous extent of the river basin, to find that far less than one-hundredth of the moisture precipitated flows off.

The damming up of water and artificial irrigation are admittedly exceedingly important and, if steadily carried through, would according to Mr. Willcock's estimate yield annually agricultural products of ten times the value of the present yearly imports of the same products.

Here I, however, wish to draw attention to a loss of water which is not so noticeable to the eye as the roaring floods of the storm swelled rivers, but yet, since constant, is far greater than the water lost into the ocean, and this immense loss of water can likewise, if not prevented, yet be considerably lessened, whereby values can be created which far exceed those of that part of South Africa capable of artificial irrigation.

On driving through the Karroo it is noticed that the slopes of hills shew a richer vegetation, larger bushes and thicker growth, than the plains between the hills with their tiny bushes, although the slopes allow a not inconsiderable portion of their rainfall to run off on to the plains, where the water mostly sinks away. We thus find the remarkable fact:—poorer vegetation with a greater supply of water. The question arises: Where does all the water remain that is not used for the supply of plants on the Karroo plains? It evaporates directly without the medium of the plants. The clayey soil of the Karroo serves as a sort of wick, as it were, which draws up the water out of the deeper layers and evaporation takes place even before the water has reached the surface, so that it traverses the upper layers in the form of steam.

This evil could be prevented, partly by giving the soil consistency in which it will be a less good conductor of heat by loosening it and supplying vegetable mould (humus) and secondly by shading. That the Karroo soil is able to produce even without irrigation a multiple of the present total mass of plants, is seen in the case of the *opuntia* which in many parts has quite changed the character of the Karroo and shews in place of the tiny bushes, brown in the dry season, the cactus, exceeding a man's height, in fresh green.

The cactus plant has got into bad odour in many cases in South Africa, as the spread of noxious kinds has been allowed, and as the natives appear less willing to work about the time that the fruits ripen.

In other countries, especially in Lower Italy, the cactus plant—of course only its best kinds—is cultivated in large quantities, if possible after very careful and deep preparation of the ground, but even on lava fields which begin to decompose, but as yet admit no other plants. The Italians fully appreciate the many good qualities of the *opuntia*. The high yield of fruit, coupled with the greatest modesty as regards requirements of soil, water, and care, the quick formation of humus whereby the soil is prepared for other plants. In the case of the dry parts of South Africa it must be added that the time when the tasty fruits ripen usually is during the time of greatest need, shortly before the rainy season, that the leaves constitute a good addition to the food of cattle and ostriches. If one does not desire that the natives shall become demoralised when the fruits ripen, one should get the natives to collect them as pig-fodder if no other use is found for them in the household. The fruits can be preserved for a long time. Of course only good, if possible, thornless kinds should be selected. Of these there are quite a number, also such as will ripen in winter, so that one can have fruits almost all the year round.

Heinrich Semler says, in his work "Tropical Agriculture," that the Mexican sheep-breeder assesses the value of a farm according to the quantity of *opuntiæ*, as these give him a guarantee that, even when the grass has long been shrivelled up and blown away, his animals will always be sufficiently fed.

The yield of *opuntiæ* is enormously high. Whereas in the case of other fodder plants it is necessary to re-sow gradually arising faulty patches, one has to guard in the case of the cactus, on the contrary, against an impenetrable thicket arising, which is, however, out of the question with the bare leaf (sic.) *opuntia*, as all cattle are fond of eating it.

The *opuntia* fulfils all the above conditions for preventing the direct evaporation of the moisture in the soil without the medium of plants. It loosens and shades the ground, and supplies it with humus, and thus enormously raises the water containing power thereof. An afforestation of the Karroo is for the most part absolutely impossible owing to want of water, and from the remainder, where, theoretically, tree-planting is possible, a large part must be deducted in which financial considerations forbid it.

The *opuntia*, moreover, offers much more than a forest under like conditions, and can still be cultivated where the growth of a tree is out of the question.

As in several provinces of Argentina, swamps dried up after extensive adjoining areas had been ploughed for cultivation of wheat, so in the Karroo the stormwaters will become lessened as soon as it is planted properly with *opuntiæ* Out of a less sudden downflow of the rivers results a reduced expense in constructing dams and increased formation of springs.

Cattle shew far less thirst when *opuntiæ* are given as additional food, and in this respect the plant may yet prove of great value in the advancing settlement of the Kalahari, for it retains its succulence when the *'tsama* is long already dried up.

LUNG WORM IN SHEEP.

Mr. Arthur J. Hill of Tylden wrote some time back as follows:— I beg to enclose an extract from a letter received by Messrs. McDougall Bros., from their New Zealand Traveller, which will be of value to farmers, as containing a cure for Lung Worm and Scour.

I am unacquainted with "Lung Worm" and several farmers to whom I have spoken do not know it. I shall be pleased therefore if you will publish, with the above mentioned extract, some information concerning Lung Worm, and whether it is known in the Colony.

EXTRACT OF LETTER RECEIVED FROM HARRISON, MANGAHOA, PAHIATUA, MAY 20TH. 1904.

"I had a letter from Mr. McDonald a Hawks Bay sheep farmer a few weeks ago. When up in that province last year I was telling a few of the farmers of the splendid results I had had with McDougall's Dip used as a drench for lung worm, which is very bad all through there this year, and Mr. McDonald among the rest was losing his hoggets wholesale, and after trying everything, decided to write and ask me for particulars of how to use our dip as a last resource. This is what he said in his letter:—

"'I am sorry to say we are losing a lot of lambs this year from lung worm. I have drenched them with Mr. Peddle's and other drenches without the slightest effect. I would very much like you to write, at your earliest, your experience and results of drenching with McDougall's Dip, and what you would advise one to do, as unless I get it stopped I will lose the lot pretty well before the Spring.'

"I wrote him at once on receipt of this, and told him exactly what to do, but if he had any fear of doing harm to try it on a few of the very worst. To day I had a long letter from him, and these are his own words after acknowledging receipt of, and thanking me for my advice."

"'I have drenched all my hoggets as you directed with splendid results. The day I received your letter I drafted off 250 of the very worst of them, and gave three table-spoonfuls of the dip diluted at 1 in 60, and the following day I saw a difference. They all seemed to be eating very keen, and their bellies let down and full. It has completely stopped the scour, and they have done grandly ever since. As soon as I saw the result of the 250 I had the rest put through at once, and out of the whole flock have only lost one since drenching. My neighbour Mr. Howse had drenched his flock three times, and still they kept dying; it did not make the slightest difference to them, but as soon as he saw the good results on mine, he had all his drenched with Mc. Dougall's, with the same highly satisfactory results. They stopped scouring at once, and started to freshen up, and up to the present he has not lost another lamb.' "

Lungworm in Cattle, Sheep and Pigs is not at all uncommon in this colony, and the Department publishesa pamphlet on the subject reprinted from the Agricultural Journal No. 12, vol, xxii, entitled " Husk, Hoose or Parasitic Disease of the lungs of Cattle, Sheep and Pigs," by the chief Veterinary Surgeon. A copy of this was forwarded to Mr. Hill. The following extracts are from the pamphlet in question :—

Symptoms.—When the *strongyles* (the worm which infests the air passages of sheep and goats is known as the *Strongyles filani*) are not numerous, the symptoms are a slight sonorous cough, occurring in fits at varying intervals. As the worms increase the cough becomes stronger, and occurs in paroxysms, accompanied by great difficulty in breathing, the animal becoming almost suffocated. During these attacks the animal shows great distress, breathing is quickened, flanks heaving, the head and neck are extended, the mouth is open and the tongue hanging out, and frothy saliva dribbling from the mouth. These fits of coughing may occur several times during the day, and the animal may die in one of them. The coughing causes the expulsion by the mouth and nasal cavities of mucus that may be streaked with blood, and contains single worms or masses of them, which are readily recognished, more particularly by their movements when they are put into tepid water.

When the disease progresses slowly, which it frequently does in this Colony, the symptoms are milder, but the animal becomes gradually emaciated, the mucous membrances become pale, the eyes sunken, the skin becomes dry, scurfy and very frequently infested with lice; the breath becomes fœtid, and diarrhœa is a frequent accompaniment towards the final stage.

The diagnosis of the disease is based principally on the character of the cough, and its occurring in paroxysms. But the true test is the presence of the worms or their embryos in the discharge from the mouth and nostrils.

Post-mortem Appearances.—In an affected animal which has been killed and bled for examination, the lower portions of the lungs present a purple colour, and are semi-solid from occlusion of the bronchial tubes, and collapse of the lobules surrounding them. On opening the bronchial tubes with a small knife or pair of scissors, the small round worms will be found lodged at the exteme end of the tubes. The cough in early stages is due to the irritation produced by these worms, but as the irritation increase the smaller terminal tubes of the lungs become blocked up, which curtails the breathing space and gives rise to the rapid and distressed respiratory movements termed by the Dutch farmer *Jagziekte.*

Treatment.—This should be mainly preventive, and this is by no means an easy matter on a farm which has once become infected, because the embryos are capable of being revivified after several months' dessication. It would appear that moisture is necessary for the development of these embryos during their intermediary stage outside the lungs of their particular host, whether that is passed in mud or in molluscs.

When the disease is discovered amongst a flock of sheep or a herd of calves or swine, all visibly affected animals should be immediately isolated from the rest, and such affected stock should be grazed on pasture growing on a dry porous soil and free from any moist or marshy places, in which the embryos could undergo their intermediary stage of devopment. They should also be prevented from drinking at the same place as the healthy stock.

The healthy stock should also be kept away from all such marshy places as much as possible, leaving these to be grazed by older cattle or horses, and a supply of uncontaminated water provided for them. When such an arrangement is impracticable, the water should be drawn into troughs, and about one per cent. of common salt added to it along with a little lime.

Curative Treatment is not very satisfactory unless it is commenced early. A large number of remedies have been tried with more or less success. Paraffin oil has been given with apparent benefit, in doses of a teaspoonful for a lamb or a young pig, to a tablespoonful for a calf. Turpentine is another remedy which experience shows is beneficial, in doses similar to those of paraffin oil. It should be mixed in a little milk or oil.

A teaspoonful to a tablespoonful of a mixture of equal parts of turpentine and sprits of camphor is also recommended.

Benzine, carbolic acid, Chabert's oil, and such like remedies have all been tried with varying success. It will be readily understood that any remedy given by the mouth for these worms must be one which is capable of reaching the lungs. In this respect turpentine occupies a principal place, as it is in part passed out by the lungs. Feeding young pigs with garlic is said to be beneficial, the same thing could be tried with lambs and calves.

Medicines have also been introduced directly into the air passages for the destruction of these parasites, first in the form of inhalations, the affected cattle being placed in a closed shed or house and made to inhale the fumes of burning sulphur and tar, the fumes of carbolic acid, iodine, or chlorine. The tar and sulphur are mixed with sawdust or dry kraal manure and placed in different parts of the shed and set fire to. Iodine vapour is evolved by placing it on hot bricks. Carbolic acid vapour by pouring the acid on hot coals on a shovel. Chlorine gas is evolved by making chloride of lime into a thin creamy fluid and adding sulphuric acid to it. .

Intratrachial Injections, that is the injections of germicides directly into the trachea or wind-pipe by a suitable syringe. One of the most favoured formulas for injection is the following.

R/	Turpentine	15 to 30 drops
	Chloroform	8 to 15 „
	Carbolic Acid	5 to 10 „
	Olive Oil	1 to 1½ drachms.

Mix

The small dose for lambs and young pigs, the larger for calves.

Another is .

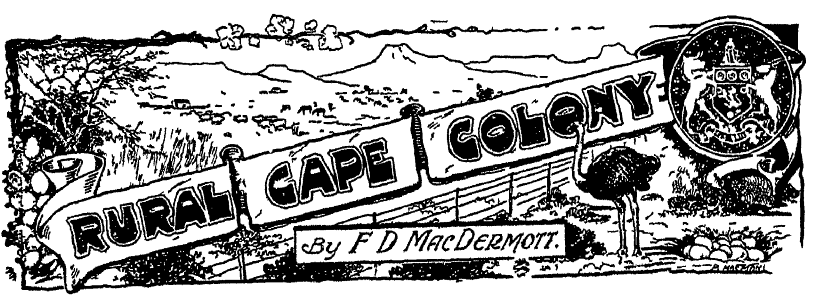
R/	Black Poppy Oil	100 parts.
	Oil of Turpentine	100 „
	Carbolic Acid	2 „
	Purified Cade Oil	2 „

Mix

From one to two drachms should be injected.

The injection should be made slowly, and repeated daily for three days at least But intratrachial injections would be somewhat difficult to carry out in the case of young pigs, and it would be a very onerous task to treat a large flock of young sheep and lambs. It is easiest and most successfully carried out in the case of calves. But I fear that without instruction and demonstration, few farmers would attempt the operation even in calves.

But whatever system of treatment is adopted, to be successful it requires to be supplemented by good nourishing food. The general health and condition of the young animal must be supported and maintained until it arrives at that stage when it would appear that the system is able to overcome the effects of these worms and to cast them out.



NO. XII.

IN THE DISTRICT OF KOMGHA

AN EASTERN FRUIT FARM.

When anyone attempts to discuss fruit-growing in the Eastern Province he is generally told that if he has any doubts as to the success of the industry in that section, in spite of several admitted drawbacks, he should see what has been done by the Flanagans at Prospect Farm near Komgha. Being in the neighbourhood recently I determined to see for myself what has been done and I must confess that though I expected to see a good deal, I was more than surprised when I went over the farm.

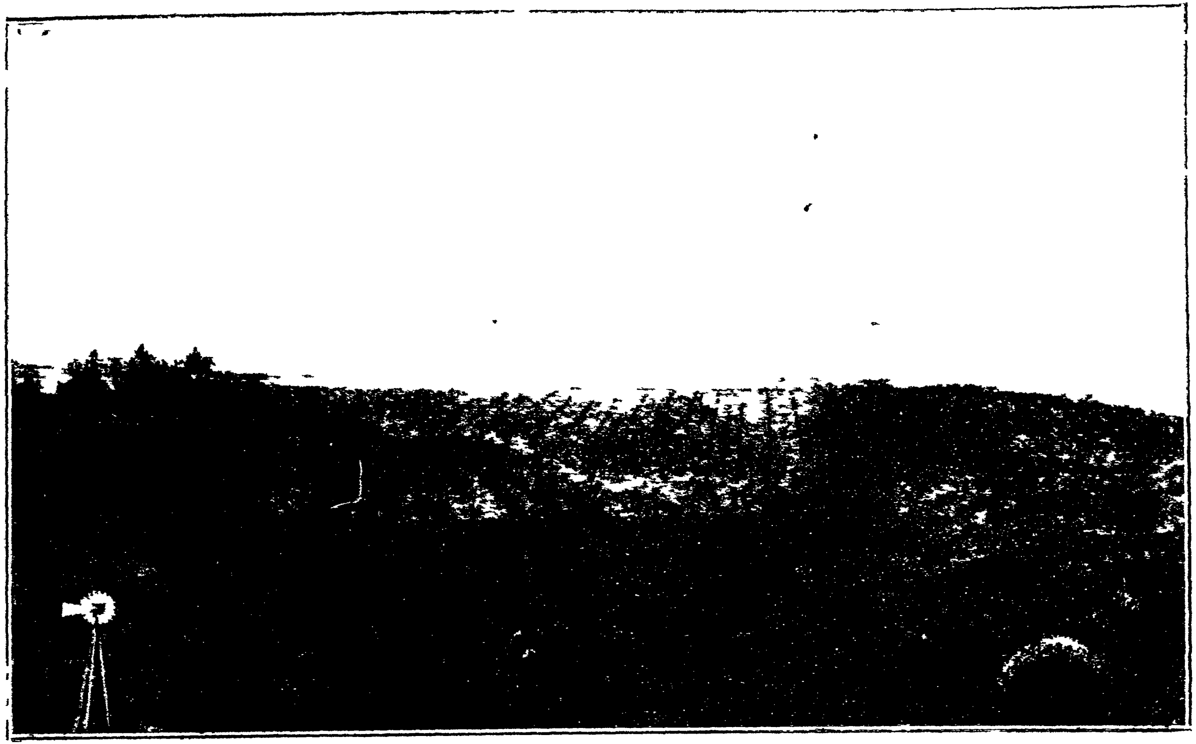
The property is situated alongside the new railway that runs from Amabele on the Eastern line to Komgha and is now being extended into the Transkei, so it is almost as far east as one can get without going into the Native Territories. It lies to the south of the railway line and largely consists of undulating ground with some fairly deep valleys. The soil is good; mostly, judging by appearances, old bush land with a good depth of reddish loam containing plenty of humus, particularly in the valley bottoms. It also seems to be well drained naturally and the water supply is fairly good though the streams were not over strong. When I visited this property the drought had lasted unbroken for about four months, and special efforts were being made to counteract the effects of this trying period on the young orchards. Yet everything looked very well indeed. The property lies within the influence of the summer rainfall and is thus subject to the troubles which afflict the fruit-grower in such conditions, but though the rains are usually heaviest in the summer, the dry winter is tempered to some extent by the near proximity of the sea, which is only about 25 miles distant as the crow flies. The modification of climate due to this cause is the more noticeable as one enters the district from the higher levels of Stutterheim and the country around the Kubusi river, and it doubtless exercises a very beneficial effect more particularly upon the fruit. The country hereabouts bears some resemblance to the fruit-growing sections of Bathurst and it will probably be found that the conditions which govern the industry there will largely influence the Komgha growers when the two sections come to compare notes. It will be seen from this short description that when the Flanagans decided to embark upon fruit-growing on a large scale, the out-look could not have been altogether devoid of difficulties which were obvious to the observant, and their courage and enterprise is all the more worthy of praise.

The district generally is largely given up to cattle and sheep, agriculture playing a comparatively small part in its industrial activity. Mealies (maize) and Kaffir corn are the staple crops and in good seasons, there is a large output; but owing to the uncertainty and comparative irregularity of the rainfall the main crop is meat and wool. The Flanagans by launching out in fruit on a large scale bid fair to change all this, and with the advent of the railway there is no apparent reason why, in the near future, a substantial proportion of the productive power of the district should not be turned in this direction.

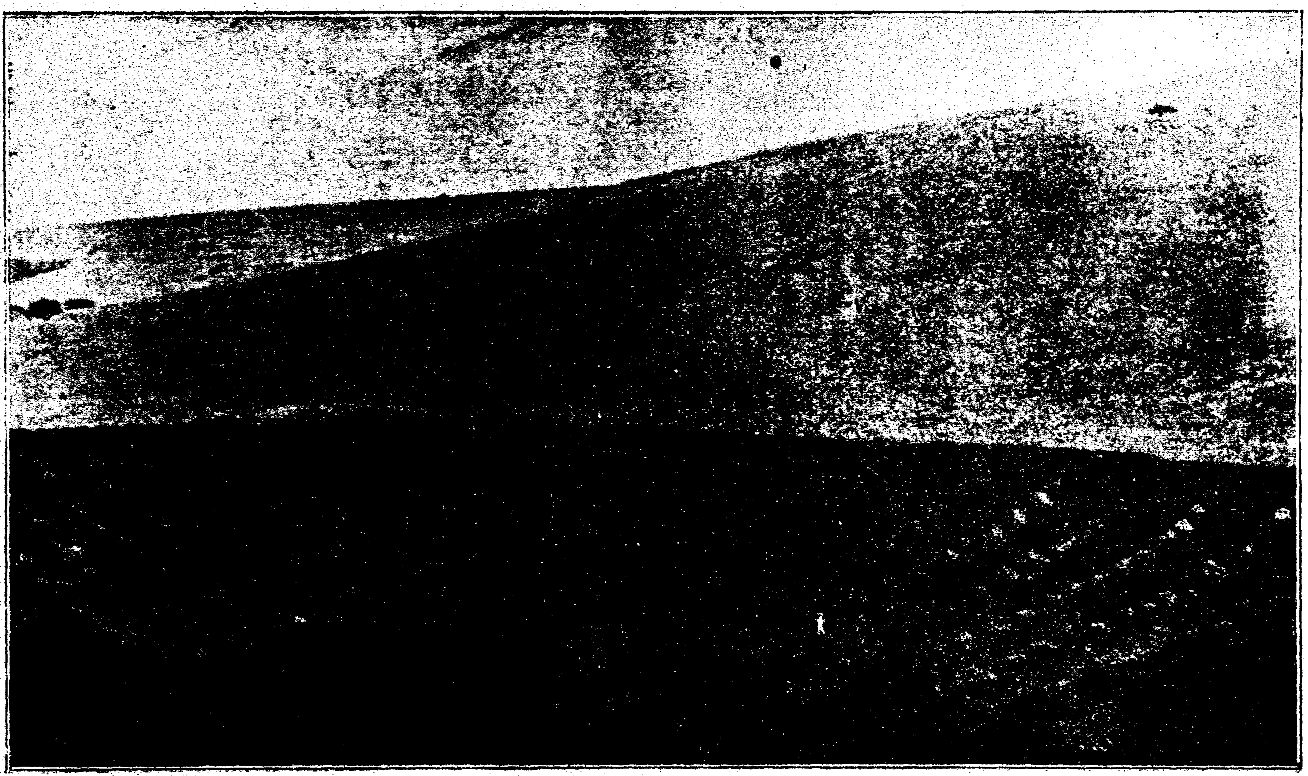
Old Homestead —Prospect Farm

A Splendid Example.

Considerably less than thirty years ago the whole of the country was laid waste by the native wars and scarcely a homestead escaped the brand of the native warriors. Among the few that were left untouched was that of Mr. Henry Flanagan, a view of which is given herewith, for the family always commanded the respect of the native chieftains. But it took some considerable time for the district to settle down and recur to normal conditions. Even then the transport difficulty was a great trouble, for the nearest railway station was Kei Road and that meant a fairly long journey with a loaded wagon, so



View of Orchards at Prospect Farm



Grove of Portugal Lemons Prospect Farm.

that the production of perishables on a large scale was out of the question. Some seven years ago, however, Mr. Henry Flanagan and his brother James became impressed with the importance of fruit-growing as an industry and with the assistance of advice from the Agricultural Department, started laying out their orchards. At first, like most new departures in this country, things looked doubtful. It was realised from the outset that unless rail transport were to become available, the old difficulties would prevail, but they hoped on, and continued their planting, being determined to be ready by the time the rail reached them. Their optimism has now its own reward for the line passes alongside the property and the Prospect Siding is at their gate, as it were. They stand as an example to the whole district, and fully deserve the reward that awaits their perseverance, for they have, undoubtedly, one of the largest and one of the finest ranges of orchards in the Eastern Province at the present day. In fact they compare very favourably with some of the larger propositions in the Western Province.

Among the photographic views herewith is one showing the well-kept orchards which lie alongside Mr. Jas. Flanagan's homestead —for there are two homesteads on the property. The house which is hidden in the trees on the left is a large and roomy brick structure, and that, together with the windmill in the valley in the foreground, gives some proportionate idea of the extent of this particular orchard. The trees planted round the house are some thirty to forty feet high and have made wonderful progress. They are mostly *macrocarpa* The belt of trees on the top of the far hill are also about the same height. Poplars are planted as wind breaks and several lines of these trees may be noticed in the views.

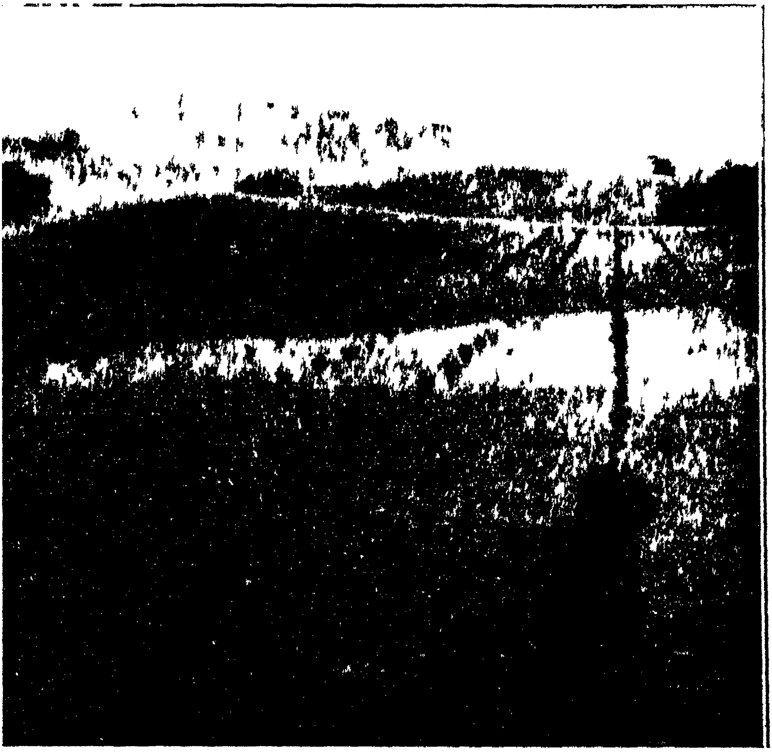
Altogether there are

TWO HUNDRED AND THIRTY ACRES PLANTED WITH FRUIT TREES.

While the whole property consists of 5,000 acres, the balance being devoted to grazing. Mr. James Flanagan showed me over the farm and I was very much impressed with the practical methods everywhere apparent. After going through a portion of the large orchard alongside his homestead we crossed the hill and descending into a beautifully wooded valley behind Mr. Henry Flanagan's homestead we came to an extensive grove of young citrus trees shown in the illustrations, and here I photographed a young naartje tree which stands about twelve feet high with a growth of two years. In the photograph Mr Jas. Flanagan is standing alongside the tree on the same level as the roots and as he is about six feet tall the height of the tree can be seen at a glance. The soil and other conditions must be excellent where such rapid growth is made. And it is not only in isolated instances that this rapid development is noticeable. Wherever trees are planted, whether on the hillsides, or in the valley bottoms, the same gratifying results are to be observed and, with very few exceptions, it may be stated that the failures so far have not been many. That this is largely due to the care and labour expended on cultivation goes without saying, for on every side indications are plentiful that this particular essential of good orchard work occupies its full share of attention.

Sixty Acres of Citrus Trees.

Continuing along the same valley about half a mile lower down we come to a splendid grove of young Portugal lemons. These are all just about bearing The extent of this magnificent grove spread along a gently sloping hill-side may be gathered from the photograph shewing only a portion of it. The growth here is also excellent, the progress made by the young trees being almost marvellous in some instances, and very good in all. There was not a sickly looking tree in the whole grove. And the whitish looking speck in the centre of the foreground is Mr. Jas. Flanagan again, whom I asked to stand in front of one of the trees to give an indication of their proportions. It is doubtful if a finer citrus grove exists in the whole of the colony, for when it comes into full bearing the output must be enormous



Young Citrus Groves —Prospect Farm

IRRIGATION.

It goes without saying that in time of drought a certain amount of anxiety is felt with regard to these extensive young orchards. When I was there no rain had fallen for something like four months and though the soil was kept in a condition of excellent cultivation and there was no sign anywhere of failure, the water question was giving rise to serious consideration. Nothing is done by halves at Prospect Farm. The water supply is limited, consisting of small streams and springs in the kloofs. These, however, are utilised to the utmost. The windmill shown in the second illustration lifts the water from one of these small streams for the homestead above, and sufficient is also lifted to supply the more pressing needs of the large orchard just alongside. This is managed by the exercise of rigid economy and the distribution of the water through pipes instead of allowing it to soak away in furrows. For the actual watering of the trees the water is led through galvanised iron furrows, like inverted ridging. These can be moved about in lengths wherever the water may be needed most, thus ensuring a supply at the right spot and obviating waste. For the large citrus orchards on the other side of the farm a further supply was being developed while I was there. Another small stream passes along the valley a little way above the lemon grove, and an earthen dam was being energetically constructed to conserve a supply, especially as a stand-by for these young trees. A goodly length of piping was laid and the dam was filling fast before I left, so I have no doubt whatever as to the result. Where so much energy and foresight are exercised, success is so fully deserved that he would be a churl indeed who did not wish success to the brothers Flanagan, in their endeavours to establish a sound industry after the expenditure of so much time and trouble.

CONSIDERATIONS FOR THE FUTURE.

Having seen most that was to be seen on the farm I naturally fell into a discussion with the projectors of all this energy as to the future. They realise that they have planted sufficient for the present, and that the great consideration for the future will be the commercial side of the venture. One has but to pause for a moment and think what such a crop may mean. To handle it effectively will call for a large staff of cheap labour and that is not always available. But so far as this particular proposition goes, I understand the proprietors have very little fear. Allowing that the labour question can be satisfactorily solved there are other considerations quite as serious which have to be faced. One has not to look very far ahead to see a busy centre of industry arising at Prospect. The picking, packing and transport of a full crop from the present orchards will mean employment for dozens of hands and the ultimate installation of a large packery with up-to-date appliances. The probable site of a large pack-house would be in proximity to the station though it may even be found more economical to run a short siding towards the centre of the farm in order to save animal transport as much as possible. The orchards are scarcely situated for economic harvesting owing to their being placed on somewhat steep slopes and towards the valley bottoms out of which the fruit will have to be hauled by animal power To meet this difficulty, not a serious one by the way, a tramway system has been suggested and will probably be installed

Young Naartje Tree (two years growth) at Prospect Farm

as the need arises. Fortunately there is an adequate supply of native labour available at present, and so far, though fairly heavy shipments are sent away, the question of harvesting and transport has not arisen in the acute form. But before many more seasons pass it will have to be faced. The markets are considered to be quite good enough and no doubts are felt on that score. In addition to the large demand for fresh fruit, big installations for jam making and canning are running or about to be inaugurated at East London, so that the surplus can be disposed of at remunerative prices. Whether the success of fruit-growing at Prospect will encourage the proprietors to emulate some Western enterprises, and launch out on the commercial side for themselves, remains yet to be seen.

SUCCESSFUL CULTIVATION OF PASPALUM DILATATUM

The attention of readers of the *Agricultural Journal* has often been called to the many virtues claimed for the grass *Paspalum Dilatatum* (Golden Crown Grass). The Flanagans have an object lesson in this also. From a trial sowing of seed obtained some time back from the Agricultural Department they have planted over two acres of this excellent drought resisting fodder grass. They are most enthusiastic about it, and speak in glowing terms of its many good points. It thrives wonderfully well here, and looked in splendid condition when I saw it after four months' drought. It had been cut just before I visited the farm, but I was assured that at its full height it stood nearly six feet. The great trouble is to keep the stock away from it for they will do anything to get a bite. The calves just revel in the hay and thrive on it splendidly. The one great fault about this crop is they have not nearly enough of it. But it is developing a splendid habit which, it is to be hoped, it will continue. It is spreading itself by degrees through the indigenous veld, and wherever it gets rooted it ousts the other grasses to a great extent, because it is hardier. On a well fenced farm, such as this, the value of this special feature cannot be over estimated. Fruit is a splendid industry, but fruit combined with dairying on a large scale such as could be supported by heavy crops of *Paspalum*, would be ideal Agriculture indeed. It would mean, ultimately, that with proper care and business management every hundred acres of a farm like Prospect would support a European family in comfort. But this is looking too far forward. For the present I must be content to note what is being done, and trust that nothing untoward may happen to arrest the development which is now going on at this highly interesting spot. For Prospect Farm is an example to the whole country.

COTTON GROWING IN CAPE COLONY.

By Arthur H. Roworth.

1.—The Opportunity.

At the present moment, in every part of the Empire where there are reasonable prospects of success, serious attention is being devoted to the question of Cotton growing. The reason for this is that, several times of late years, the crop in America (whence come three-fourths of the whole supply) has fallen short (or, what comes to the same thing, has been cornered by unscrupulous speculators), so that Cotton has more than once been absolutely unprocurable. Millions of spindles and thousands of looms have consequently been forced to stand idle, entailing heavy losses, sometimes ruin, on the masters, and terrible suffering and privation on the work-people. Matters have steadily been getting worse, and as the consumption of Cotton is regularly increasing year by year, while the area in the United States over which this crop can be produced is capable of very little extension, it follows that the position is rapidly becoming a desperate one. The tremendous interests at stake may be realized in some measure from the fact that in the British Isles alone it is estimated that there are not less than 10,000,000 people (or practically one-fourth of the whole population) dependent more or less on the cotton industry for their means of subsistence. In the face of this the *certainty* that the world's consumption of Cotton was rapidly overtaking (if indeed it had not already overtaken) the *possible* productive power of the existing Cotton fields—that within, at the very outside, another ten years the annual supply *must*, if nothing were done, fall short of the demand by at least 1,000,000 bales, and *might* at any time (even next year), from unavoidable causes, fail to the extent of 2,000,000 or 3,000,000 bales—such a prospect was surely a sufficiently appalling one to contemplate. That, however, was exactly the position in which the Lancashire Cotton spinners and manufacturers found themselves, and with characteristic pluck and energy they have applied themselves to the task of finding a remedy. In India they have long had a considerable source of supply of the lower grades of Cotton, but unfortunately India has not hitherto proved capable of producing Cotton of the requisite staple and colour to replace American. It is largely used for "mixing," but is by itself unsuited for any but the coarsest work. The West Indies had produced, in time past, small quantities of Cotton of the highest quality, but, from one cause or another, the industry had practically become extinct. Upon some parts of the West Coast of Africa spasmodic attempts had been made to grow Cotton at various times (the writer remembers, in Manchester, receiving several bales from Mossamedes about 15 years ago), but there was no system about these efforts, and they came to nothing. Egypt of course has grown Cotton from time immemorial, but Egyptian Cotton cannot be used for all purposes—for some it is unsuitable, for more it is too expensive.

It was therefore a matter of life and death that new fields should be opened up, and placed upon a sound commercial basis, without delay. These Lancashire men are not in the habit of sitting down and waiting for providence to extricate them from their troubles any more than they are accustomed to look to a paternal Government for assistance in their difficulties. So, some years ago, a movement was started, in a comparatively small way, in the great spinning centre of Oldham, which has grown and spread until, some six or eight months ago, it finally took shape in the incorporation by Royal Charter of the "British Cotton Growing Association" with an authorised capital of half a million, of which some £170,000 has already been subscribed, principally in Lancashire itself, by spinners, manufacturers, merchants, tradesmen, operatives, trades unions, banks, insurance companies—every class of the population in fact. This Association has for its sole object the promotion by every means in its power, of Cotton growing in any and every part of the Empire which holds out reasonable prospects of success, the end in view being of course the discovery and development of new, independent, and *permanent* sources of supply. The means whereby it is carrying out this invaluable work are many and varied, and include the making of free grants of seed, in sufficient quantities to make experiments on an ample scale, the giving freely the services of experts to advise as to the cultivation, and, *so far as its means will allow*, the supplying on loan or hire-purchase of the requisite machinery for ginning, pressing, and otherwise dealing with the crop when ready. It further undertakes to find a market for all merchantable Cotton which can be produced, either selling same on account of the planter or buying it outright on the spot.

Here, then, is our opportunity. There can be no reasonable doubt that in many districts of this Colony, Cotton can be grown as successfully and as profitably as in any part of the world, but the resources of this Association, large as they may seem, are in reality little adequate for the immense and increasing demands which are being made upon them; it is simply a matter of "first come, first served," and if we delay to move in the matter, we may easily find ourselves too late.

The West Indies have, perhaps, taken up the matter most strenuously—in fact, the prospects in that quarter of growing in the very near future large quantities of the highest grade cotton are of the highest. It is estimated that this season there are at least 8,000 to 10,000 acres under cotton in the various West Indian Islands, where in 1902 there were barely 400! Nigeria, and other districts of the West Coast, Uganda, Rhodesia, Australia, are all directing their attention to the industry. Even our neighbour Natal is experimenting, and will doubtless prove successful with the shorter stapled varieties of cotton, though for many years it is not likely that she will be so with the "long-stapled" and much more valuable grades, for which the prospects in our Colony appear the most favourable. But if we are not to be left out in the cold, we must be up and doing without delay. Application has already been made to the Association for a grant of seed of various kinds for experimental purposes, which the Department of Agriculture will take charge of and distribute in the rotation in which applications are received.

2. Cape Colony as a Cotton Field.

I have said above that there was every reason for confidence that Cotton could be grown as successfully and profitably in many parts of Cape Colony as in almost any part of the world; what, then, are the grounds for such a conclusion? Roughly speaking, any district lying between 40° North and 40° South of the line is a *potential* Cotton-field—*provided* that the *soil* is appropriate and that there is either *sufficient rainfall* or *irrigation facilities*. There are undoubtedly enormous tracts of land in this and the neighbouring Colonies which fulfil all those primary conditions.

(*a*) As to soil.—For the highest grades of cotton such as "Sea Islands" and "Egyptian" the most suitable soil is a *sandy loam*, or a *medium light soil*, of good average fertility, where there is *good drainage*. The soil in the "Sea Islands" consists, for the most part, of a *fine sandy loam*, resting upon a sub-soil of yellow sand, or yellow clay with a large proportion of sand. Analysis does not reveal the existence in this soil of any special elements beyond what any soil of such a general character would be expected to contain. Generally, it may be said, that a soil which will grow sweet potatoes or mealies will be found suitable for Cotton, but it is only by experiment that it can be definitely determined what particular variety of Cotton will do best in any given locality.

(*b*) As to Climate.—The most favourable climate for Cotton-growing is one in which the *rainy* and *dry* seasons are *distinctly defined* and the danger of *frost* non-existent. It is important that the plant should have plenty of moisture during its *time of growth* (say for the first 4 or 5 months after sowing), while, on the other hand, it should be possible practically to rely upon a dry, sunny season for the period (some 3 or 4 months) when the crop is *ripening and being picked*. By varying the time of sowing according to the rainy season in different localities, these advantages can be easily secured in a large part of this Colony. I mean, of course, that the time of sowing should be always just about the time the rains commence.

It appears, therefore, that there is at least strong *prima facie* evidence of the indispensable conditions required for successful Cotton-growing being fully satisfied in the Cape Colony, but the question may fairly be asked: "Will it pay?" I would answer, in the first place, that it is at any rate one of the *safest* crops which a farmer can lay down. Everything, of course, has its risks, but the dangers which surround the growing of cotton, are, with the most ordinary care, distinctly less than those which threaten almost any crop grown in this Colony. In the States the great enemy is frost, which at times commits the most terrible ravages—here this may be considered a negligible quantity. To insect pests and blight it is not especially liable (though of course the Cotton plant has such foes like everything else) and experience has devised excellent means for fighting these enemies. Then, the continual (and often most justifiable) complaint of our farmers is that when they *have* got a good crop they can either find no market at all for it or else they have to sell at unremunerative prices—at least, I have known this happen in some cases and in different parts of the country. Well, there need be no misgivings of that kind about Cotton. To commence with, as I have before mentioned, the Association is prepared to guarantee the sale of all the merchantable Cotton which we can produce—even, at a pinch, to buy the Cotton outright on the spot. For very many years to come there need be no apprehension as to the ability of the world to absorb, at remunerative prices, every pound of Cotton which can be produced,—sometimes, of course, at a very large profit to the planter, at others at a comparatively small one, but always, it may be safely predicted, at a price to repay the grower. I speak now, of course, of cottons of an average grade, such as American "Uplands," but with our exceptional advantages in this country there appears to be no reason why we should not be successful with the higher grades like "Egyptian" and "Sea Islands" for which, in consequence of the comparatively restricted area in which they can be grown, there is *always* a high price obtainable. In the case of the latter, at any rate, the demand always exceeds the supply, and Cotton grown in the West Indies from "Sea Islands" seed has fetched already last year 14d. to 15d. per lb. in the English market. Experiment alone can decide whether our good fortune will extend thus far, but there is every justification for optimism.

As to the profits which may reasonably be expected, it will be seen from the above that very much, of course, depends on the class of cotton which we may be able to grow—not *everything*, however, since, whilst the better grades, of course, fetch by far the highest prices, their care and cultivation are throughout more costly, they are more delicate and liable to damage, and so on. Some slight indication however, may be found in the *official* estimates in other countries and we find that in South Carolina, U.S.A. it is estimated that the *average net profit* after paying all expenses is about £4 10s. per acre, whilst in the West Indies it is given as high as *£5 2s.* per acre, both calculations being based on the *very* moderate average yield of 204 lbs. of "lint" per acre. It is nothing unusual to get 300 lbs. and over off an acre—the *record*, I believe, being no less than *566 lbs.* off a *single acre*, upon which the lucky planter made a profit of *nearly £30.*

So much for the advantages to the farmer himself—what an untold blessing it would prove to the country at large, in the money which it would pour in, the employment which it would find, the return freights which it would provide and so on, surely needs no pointing out.

3.—The Cultivation of Cotton.

I will presume that the reader has determined to go in for Cotton-growing. What is the first step to take? Any farmer who is prepared seriously to take the matter up should communicate without delay with the Agricultural Assistant, Department of Agriculture, Cape Town stating what he is willing to do, the *extent* of the experiment he intends to make, full particulars as far as possible, regarding the rainfall and irrigation, temperature, &c., of his district—in fact any information which will assist in coming to a conclusion as to what description of Cotton is most likely to do well. He should further give as good a description as he can of the soil and subsoil. The department will then, on behalf of the British Cotton Growing Association, furnish him with sufficient seed of the kinds *most likely* to succeed under the prevailing conditions, to enable him to make a fair experiment.

Bearing in mind that *exactly* the best time for sowing can only be determined from actual experience, but that the plant should have rain during the first four or five months, and dry weather for its three or four months bearing, he will prepare his land to receive the seed. In the Western Province, where there are winter rains June and July will probably be found the best months for sowing leaving the picking season from December to February and March, while where the summer rains prevail it may be better to delay, sowing until October or even November, but all this is matter for experiment. All but *very* fertile soil requires *some* manuring, but except in the case of exceptionally poor land (which, indeed, it is a waste of time to experiment with) *excessive* manuring is not desirable—it may, in fact be positively injurious. Farmyard manure is the ideal one, but any good chemical manure will suffice.

The seed must be planted in *hills* the *distance* between which, and between the rows depends very much on the land and the kind of cotton grown. In the "Sea Islands" it is found that the Cotton does best when planted in rows 5 feet apart, and 20 inches apart in the rows, whilst in other districts the rows are only 3 to 3½ feet apart and the "hills" 12 to 15 inches. This, again, is a matter which only experience can satisfactorily decide.

In each "hill" put about four seeds, *an inch deep*, which should germinate in four or five days. As soon as the young plants are about a fortnight old, pull out the weaker ones, only leaving the two strongest ones in each hill. A fortnight later still, the weaker of the two remaining plants should also be pulled out, leaving the stronger only. At this time, any blanks, if such there be, in which the seeds have altogether failed to germinate, or which show signs of weakness, may be replanted with the most vigorous plants removed from the others.

On level, or nearly level ground it is not necessary to throw up ridges to plant the seed on but in slopes it would be advisable to do so, say about six inches high, and as nearly level as possible—in order to check the flow of water during heavy rains.

When the plants are about eight inches high and again when from 12 to 16 inches, they should be "moulded up." The land should be kept free from weeds until the Cotton plants cover the ground sufficiently to prevent the weeds from growing, but no weeding should be done after the "bolls" or cotton pods begin to form.

A cotton plant should be low and compact, branching near the ground, and should have small close-pointed limbs and a large number of "bolls."

In about five months after planting the first "bolls" will begin to open, and if the plants are properly cared for, they will keep on fruiting and opening for four months or so. Cotton should only be plucked out of the "bolls" when the later are *fully opened,* but it must not be left on the plant any longer than is unavoidable *after* this occurs.

The art of picking Cotton is quite an easy one to master and the labourer soon becomes expert and rapid, readily picking 100 lbs. per day. The "boll," or case, should be held firmly with the *left* hand, and the whole of the Cotton (of course including the seeds,) should be removed by the *right* hand, *with one pull.* In order to have both hands free, each picker should be supplied with a canvas bag, 2 feet long by 18 inches wide, made to hang from the shoulders. He is then enabled to remove anything in the shape of leaves, &c., which may possibly adhere to the Cotton, before dropping it into the bag. This is easily done at that time, but will be found much more difficult afterwards. When the bags are full they should be emptied into a sheet or large basket placed at the end of the rows where there should also be some contrivance to cover up the Cotton in case of rain.

Except perhaps in *very* dry weather it is advisable to spread the Cotton for a little in the sun after picking, and this is *absolutely necessary* if the Cotton shows the least sign of dampness, as it is then liable to heat, become discoloured, and deteriorate much in value, after being packed. It cannot be too strongly impressed on the planter that everything that stains, discolours and dirties the Cotton in any way tends greatly to lower its market value—in determining the value of a sample, cleanliness and good colour come only second to silkiness and length of staple, in fact dirt and stains will enormously reduce the price of otherwise splendid Cotton.

These are all the instructions necessary for the experimental stage beyond which it will not be possible to go this season, as in small quantities, the Cotton can be marketed as it comes from the field, but to deal with a large crop,—such as we hope very shortly to raise—expensive and intricate machinery is required, to separate the fibre, or "lint," from the seed (both of course, coming away from the "boll" together, and to produce from the seed the valuable "oil" which it contains, and "cake" or "meal" one of the richest cattle foods in the world. These by-products constitute all important factors in the financial aspect of the industry.

For the present however all that we need trouble about is to demonstrate our ability to grow good and merchantable cotton in paying quantities,—we may then rest assured that the requisite arrangements will be speedily made to efficiently deal with all that we can produce.

ALBANY AGRICULTURAL SOCIETY.

GRAHAMSTOWN SHOW, 1905.

The popularity of the Grahamstown Show grows every year, now that the society has got into strong hands, and the farmers of the Eastern and Midland Districts seem inclined to do all they possibly can to support it. With such a combination of favourable conditions the future is certainly bright with promise, and it only needs a little faith in that future, combined with enterprise and courage to place the Grahamstown Show very high indeed among the most useful of our Annual Agricultural Exhibitions. In spite of the terrible drought, which was nowhere felt with greater severity than in the districts from which the Albany Show draws its main support, the committee courageously decided to hold the Show and the result fully justified their action. Not only were the entries large and of excellent quality, everything considered, but they were in many cases, well in excess of last year. The stock, with the exception perhaps of cattle which bore the marks of the drought, were all brought on in excellent condition. The horses were an excellent lot. The sheep and angora goats have never been equalled in a Grahamstown Showyard and the pigs and poultry were also creditable. Farm produce and vegetables were not equal to last year's exhibits, but fruit was better and compared favourably both for quality and variety with many of the shows in the Western Province. Fruit growing is just beginning to make itself felt in the Eastern Province and may now be expected to assume dimensions of increasing importance as the larger orchards come into bearing. Lower Albany supplies a magnificent selection of pines and citrus fruits from established grounds and now that the other fruits are coming on, the day is not far distant when a very brave show will be made. The only failure as a section was that of dairying, in which there was no entry. This is entirely accounted for by the drought which, strange to say, was broken up by good showers within ten days of the closing of the Show. So successful was the Show generally that there can be little doubt as to the necessity of seriously considering the question of a new and enlarged show-ground.

WOOL AND MOHAIR.

The competition in the wool section, particularly in the bulk classes for Grass-veld and Mixed-veld Grease was very good and the samples exhibited were all good. Mr. Geo. Blaine, of Kei Road, whose excellent clip is so well known to all connoisseurs throughout the country topped the list, taking three firsts for grass-veld grease-wools. The mohair was good, but there was very little competition. The prize list was as follows:—

500 lbs Grease Wool, of merino sheep, grass-veld, of not more than 12 months' growth, grown by the exhibitor: 1, George Blaine Kei Road; 2, J E Wilmot, Highlands; recommended special prize, J E Wilmot, Highlands. 500 lbs Mixed Veld, or other Special Karoo or Grass-Veld Grease: 1, E J Niland, Mount Pleasant, Fort Beaufort. 500 lbs Hoggets' or Lambs' Grease Wool, of merino breed, grown by exhibitor from sheep not previously shorn: 1, George Blaine, Kei Road; 2, E J Niland, Mount Pleasant, Fort Beaufort. 20 fleeces of merino wool in grease, grass-veld: 1, George Blaine, Kei Road; 2, T T Hoole, Atherstone. 20 fleeces of merino wool in grease, mixed veld, or other than special karroo or grass-veld; 2, George King and Sons, Bedford.

500 lbs Mohair, grown in the Karroo, combining length, fineness, and lustre: 1, A B Hobson, Martyrsford, P O Jansenville; 2, R Cawood, Mortimer. 500 lbs Mohair, grass-veld: 1, R Cawood, Mortimer. 250 lbs Kids' hair, grown in the Karroo: 1, A B Hobson, Martyrsford, P O, Jansenville; 2, R Cawood, Mortimer. 250 lbs Kids' hair, grass-veld: 1, R Cawood, Mortimer.

OSTRICH FEATHERS.

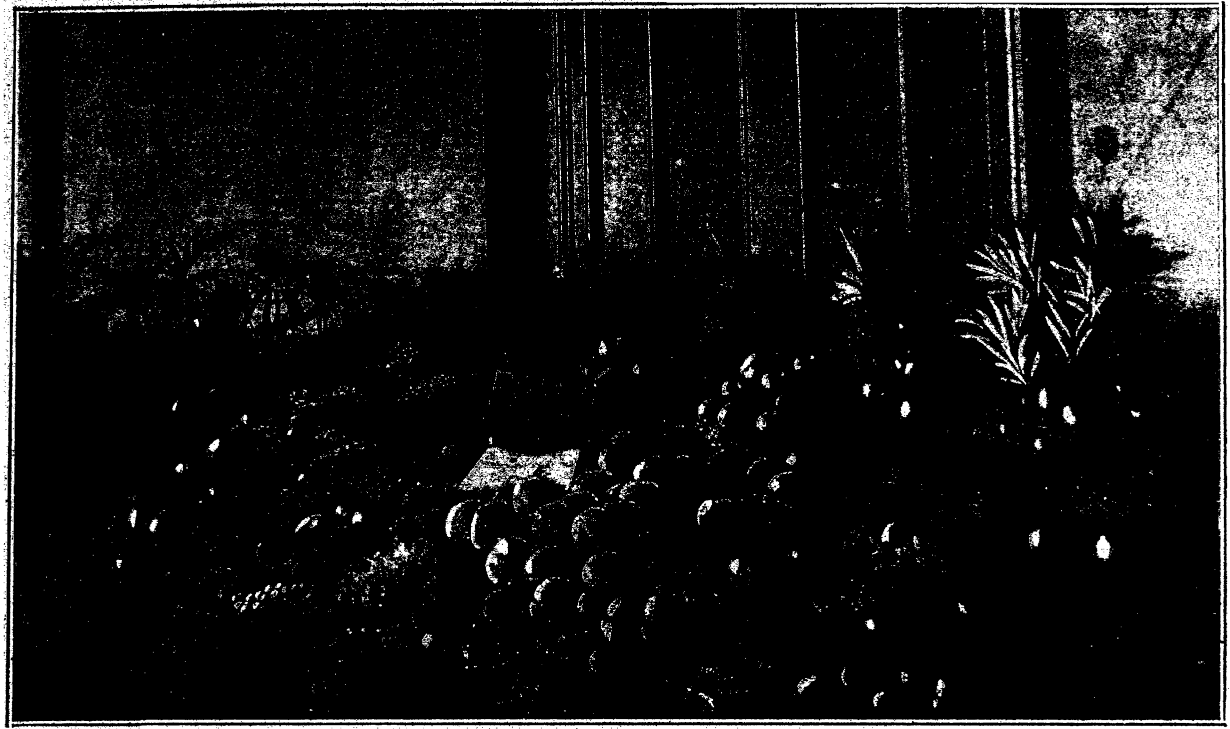
The exhibits in this section were not only plentiful, with good competition, but the quality all round was very creditable. All the classes but two were well filled, the two exceptions being "Long Drabs" and "Chickens (spadonas)," and there was but one entry in each, though these were considered sufficiently meritorious to win first prizes. The competitors included representative growers from Oudtshoorn, Graaff-Reinet, Middelburg, and Bedford, as well as those from the immediate neighbourhood. The prizes were awarded as under:—

1 lb Prime White Feathers: 1, O E G Evans, Bedford; 2, Ockert Fourie, Oudtshoorn. 1 lb Long Blacks: 1, O E G Evans, Bedford; 2, W E Murray & Sons, Graaff-Reinet. 1 lb Long Drabs: O E G Evans, Bedford. 1 lb Feminas: 1. Ockert Fourie, Oudtshoorn; 2, O E G Evans, Bedford; v h c, W E Murray & Sons, Graaff-Reinet. 1 lb White Tails: 1, W E Murray & Sons, Graaff-Reinet; 2, O E G Evans, Bedford. 2 lbs Chickens (Spadonas): 1, G L White, Aylesby. Best variety of Ostrich Feathers, not less than 2 lbs in all, and to be of not less than ten distinct kinds of not less than 3 ozs each: 1, Ockert Fourie, Roodeheuvel, Oudtshoorn; 2, O E G Evans, Bedford; 3, Alfred White, Hell Poort. Variety of Ostrich Feathers, grown in the Albany, Victoria East (Peddie) and Fort Beaufort Divisions: 1, Alfred White, Hell Poort; 2, G L White, Aylesby; 3, Douglass & Son, Heatherton Towers.

MERINO SHEEP.

Both the "robust" and the "fine-woolled" divisions of this section filled up remarkably well and it is safe to assert that the display of merinos has never been surpassed outside Port Elizabeth.

Ostrich Feathers at the Grahamstown Show



First Prize Fruit Exhibit at Grahamstown Show.

To give an idea of the quality, apart from the mere numbers, it was only necessary to glance through the list of exhibits which included most of the more prominent of our stock-breeders. These included Messrs. Adams & Son, Tarkastad; T. T. Hoole, Atherstone; G. A. Rogers, Cathcart; J. A. Sieberhagen, Richmond; J. H. King, Tarkastad; H. L. Dugmore, Cathcart; F. W. Southey, Steynsburg, whose entries included the robust woolled champion ram and ewe, both imported; S. J. Marais, Dordrecht; Geo. Blaine, Kei Road; Painter & Leonard, Adelaide; and Geo. King & Sons, of Bedford, who provided the champion ram, fine-woolled, besides other winners. It is not often one gets the chance of seeing Mr. Blaine's sheep on show, though his wool is known for its excellent quality and prize-winning faculty on every show of importance in the Colony. But the excellence of fleece which gave him the wool prizes did not carry his sheep exhibits to victory, for the only notch he scored was a second for a four-tooth ewe, South African-bred. The full list of awards is as under:—

FINE WOOLLED TYPE.—Imported pure bred Merino ram, not under 4 tooth: 1, T T Hoole, Atherstone; 2. C Adams & Son, Tarkastad. Imported pure bred Merino ewe, not under 4 tooth: 1, T T Hoole Atherstone; 2, C Adams & Son, Tarkastad. South African-bred Merino ram, 2 tooth and not over 21 months old: George King & Sons, Bedford; J H King, Tarkastad South African-bred ewe 2 tooth and not over 21 months old; 1, F W Southey, Steynsburg; 2, J H King, Tarkastad. South African-bred Merino ram, not under 4 tooth: 1, J H King, Tarkastad; 2, G King & Sons, Bedford; h c, J G Sieberhagen, Richmond. South African-bred Merino ewe, not under 4 tooth: 1, G King & Sons, Bedford; 2, Geo Blaine, Kei Road. Pen of 3 South African-bred Merino rams, not under 2 tooth: 1, F W Southey, Steynsburg; 2, J H King, Tarkastad. Pen of 3 South African-bred Merino ewes, not under 2 tooth: 1, J H King, Tarkastad; 2, G King & Sons, Bedford. Champion ram: Geo King & Sons, Bedford. Champion ewe: F W Southey, Steynsburg.

ROBUST WOOLLED TYPE.—Imported pure-bred Merino ram, not under 4 tooth: 1 and 2, F W Southey, Steynsburg. Imported pure bred Merino ewe, not under 4 tooth: 1, F W Southey, Steynsburg; 2, C Adams & Sons, Tarkastad South African-bred Merino ram, 2 tooth and not over 21 months old: J G Sieberhagen, Richmond; 2, H L Dugmore, Cathcart South African bred ewe, 2 tooth, and not over 21 months: 1, S J Marais, Dordrecht; 2, F W Southey, Steynsburg. South African-bred Merino ram, not under 4 tooth: 1, J H King, Tarkastad: 2, G A Rogers, Cathcart. South African-bred Merino ewe, not under 4 tooth: 1. S J Marais, Dordrecht; 2, J G Sieberhagen, Richmond. Pen of 3 South African-bred Merino rams, not under 2 tooth: 1, Painter & Leonard, Adelaide; 2, J G Sieberhagen, Richmond. Pen of 3 South African-bred ewes, not under 2 tooth: J H King, Tarkastad; 2, J G Sieberhagen, Richmond. Champion ram: F W Southey, Steynsburg. Champion ewe: F W Southey, Steynsburg.

PERSIAN SHEEP.

There was any amount of competition in this section, and a very high standard of excellence was shown. The prizes were allotted as follows:—

Pen of 1 Persian ram and 5 Persian ewes. thoroughbred, not under 2 tooth: 1, S M Gadd, Tafelberg Station; 2, J P de Wet and J P B Celliers, Boshof. O.R.C. Thoroughbred Persian ram, not under 4 tooth: 1, J P de Wet and J P B Celliers; 2, Hougham Abrahamson, Long Hope. Thoroughbred Persian ewe, not under 4 tooth: 1, S M Gadd; 2, J P de Wet & J P B Celliers: v h c, Hougham Abrahamson. Pen 3 thoroughbred Persian ewes, not under 4 tooth. 1, S M Gadd; 2, J P de Wet & J P B Celliers. Pen of 3 thoroughbred Persian rams, not over 2 tooth: 1 and 2, J P de Wet & J P B Celliers. Pen 3 thoroughbred Persian ewes, not over 2 tooth. 1. Hougham Abrahamson; 2, S M Gadd. Thoroughbred Persian ram, not over 2 tooth: 1, S M Gadd; 2, J P de Wet & J P B Celliers; v h c, Hougham Abrahamson. Thoroughbred Persian ewe, not over 2 tooth: 1 and 2, Hougham Abrahamson.

Angora Goats.

The Angora goats were about the handsomest lot ever seen up to that time on a South African show yard, for it may be safely asserted that on no previous occasion has so much quality and uniform excellence been displayed. The judges must have had their hands full with each class, for as one looked at the pens each seemed to claim a prize on its own merits. The champion was found in the 2 tooth class, being awarded to Messrs. I. Hobson & Sons' representative, while three of the four "specials," set up for competition among registered stock only, were swept off by Mr. A. B. Hobson, of Martyrsford, Jansenville. The prize lists included the following:—

South African bred ram, not under 4 tooth: 1, Percy E Hobson, Ebenezer, via Jansenville: 2, A B Hobson, Jansenville. South African bred ram, 2 tooth: 1, I Hobson & Son, Jansenville· 2, A B Hobson, Jansenville. Pen of 3 South African bred rams, not under 2 tooth: 1, A B Hobson; 2, R C Holmes, Pearston Pen of 3 South African bred ewes, 2 tooth; 1, A B Hobson; 2, R C Holmes. South African bred ewe, not under 2 tooth: 1, I Hobson & Son: 2, A B Hobson. South African bred ewe, not under 6 tooth: 1, A B Hobson; 2, W C Berrington, Jansenville. Pen of 10 ram kids: 1, G King & Sons. Pen of 10 ewe kids: 1, G King & Sons.

Special Prizes—(For Registered Stock).—Angora ram, over 18 months old, progeny from goats registered by the S.A. Goat Breeders' Association: 1, A B Hobson, Jansenville. Angora ewe, same age and conditions: 1, A B Hobson, Jansenville. Angora ram, not under 6 tooth, progeny from goats registered by the S.A. Goat Breeders' Association: 1, A B Hobson, Jansenville. Angora ewe, same age and conditions: P E Hobson.

Champion Ram.—I Hobson & Son, Jansenville.

Ostriches.

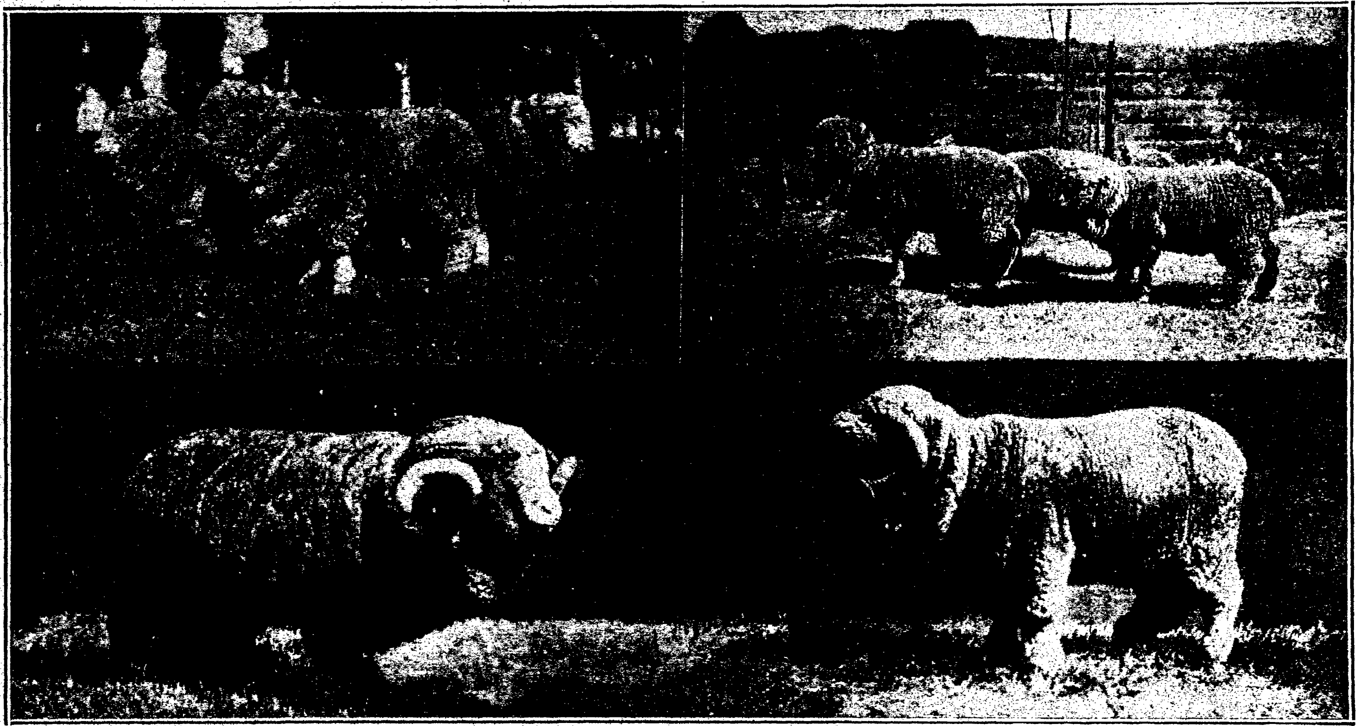
Pen of 10 ostriches, not less than 6 nor more than 9 months old, bred by exhibitor: 1, D Bowker, Tafelberg Station; 2, G T Palmer, Grahamstown; 3, Douglass & Son, Heatherton Towers.

Pen of 5 cock feather birds, in full plumage: 2. G T Palmer, Grahamstown.

Horses.

The horse section attracted some aristocratic competitors, the De Beers Co. sending down Conroy and Oakdene, two of the finest thoroughbred stallions that ever came to this country, as well as a number of other distinguished-looking animals, several being direct descendants of these two sires. In addition, there were some local thoroughbreds of merit. Mr. Arthur Forbes, of Schoombie, had a good show of Hackney blood, while the various classes for saddle and driving horses, ponies, &c., produced a cavalcade that made quite an imposing array. The leaping competition, too, seemed to show better form than is usually displayed at such gatherings. The prizes were awarded as follows:—

Imported thoroughbred stallion, combining blood, power, and symmetry, not under 4 years old: 1, De Beers Consolidated Mines, Ltd, Kimberley—Conroy, 12 years old; 2, De Beers Consolidated Mines—Oakdene, 11 years, bred by H.M. King Edward VII. South African thoroughbred stallion, same qualities, not under 4 years old: 1, G L White, Aylesby—Woodbine; 2, G Brink, Grahamstown—Ginger. Hackney, Cleveland, or roadster stallion: 1, Arthur Forbes, Schoombie. South African thoroughbred brood mare, combining same qualities, not under 4 years: 1, A Robertson, Norval's



1st and Champion Ewe (Robust) Grahamstown.

1st and Champion Ewe (Fine).

2nd Robust, 2-Tooth, Grahamstown
and Port Elizabeth.

"His Majesty," 1st and Champion (Robust), Grahamstown. 1st (Robust) Port Elizabeth.

"Taxpayer," 1st Port Elizabeth 2-Tooth (Fine).

Mr. F. W. Southey's Tasmanian Prize Sheep.

Pont; 2, De Beers Consolidated Mines. Imported hackney, Cleveland, or roadster mare: 1 and 2, Arthur Forbes. South African bred brood mare; 1, Arthur Forbes, Schoombie; 2, T W Palmer, Blaauwkrantz. South African thoroughbred entire colt, not more than 3 years off, combining blood, power, and symmetry: 1 and 2, De Beers Consolidated Mines—Glenroy and Sir Bevis Hackney, Cleveland, or roadster entire colt: 1, De Beers Consolidated Mines—Shamrock; 2, Arthur Forbes, Schoombie South African thoroughbred filly, not more than 3 years off: 1, De Beers Consolidated Mines—Bayadere. Hackney, Cleveland, or roadster filly, not more than 3 years off: 1, De Beers Consolidated Mines—Pansy; 2, Arthur Forbes, Schoombie. Riding horse, stallion, mare or gelding, to be exhibited under saddle: 1, F C M Wienand, Bedford; 2, S M Gadd, Tafelberg South African bred riding horse, to be ridden by a lady: 1, G King & Sons, Bedford; 2, A T Davies, Rokeby Park, South African bred riding horse, not over 14½ hands, to be exhibited under saddle: 1, F Palmer, Grahamstown—Cecil; 2, Webb Bros, Grahamstown. Pony, not over 14 hands, to be exhibited under saddle: 1, J van Niekerk, Somerset East; 2, J Biden, Grahamstown; h c, J van Niekerk, Somerset East. Pair of carriage horses, combining power, symmetry, and action, not under 3 years, to be exhibited in harness: 1, Dr J T Davies, Grahamstown; 2, De Beers Consolidated Mines—Mambrina and Guy Wilkes. Pair cart horses: 1, J R Ivy, Grahamstown; 2, De Beers Consolidated Mines—Silver Tail and Elsie. Pair buggy horses, not over 14½ hands: 1, S A White, Norval's Pont; 2, Webb Bros, Grahamstown. Phaeton or dog cart single harness horse, exhibited in harness: 1, Mrs A M Bowhill Grahamstown—Lady Alice; 2, F Fisk, Grahamstown; h c, H M Lowe, Iquibica; T T Davies, Rokeby Park. Single dray horse not under 16 hands, and not under 5 years, to be exhibited in harness: 1, Heazlett & Hall, Port Elizabeth. Best leaper, over 2 flights of bush hurdle or trench: 1, G King & Sons, Bedford—Moscow; 2, H Conder, Grahamstown—Polly; 3, F C Balmer, Grahamstown - Moscow.

CATTLE.

The cattle section was not a particularly strong feature of this show. The drought had a good deal to do with keeping many away and those that were present bore indications of the severity of the season. Even stall-fed stock seems to be affected in some unaccountable degree by the prolonged drought which has afflicted these parts of the country. The entries, speaking generally were poor and there was little or no competition in most of the classes, particularly the breeding stock, while many of the classes did not attract a single entry. The champion was found in a handsome imported shorthorn bull the property of Mrs. Distin, of Bowden Hall, Middelburg. The prizes were as under:—

Imported Shorthorn bull, over 2 years: Mrs W Distin, Bowden Hall, Middelburg, C C. Imported Channel Island bull, Guernsey, Jersey, or Alderney, over 2 years: 1, W H Pigott, Highlands. South African-bred Friesland bull, over 4 years: 1, Webb Bros, Grahamstown. South African bred shorthorn bull, over 4 years: 1, G King & Sons, Bedford. South African-bred shorthorn bull, from 2 to 4 years: 1, G. King & Sons, Bedford; h.c., C Adams & Son, Tarkastad. South African-bred shorthorn bull, under 2 years: 1, Webb Bros, Grahamstown. South African-bred Devon bull, over 2 years: 1, Mrs E Brook, Grahamstown. South African-bred Ayrshire bull, over 2 years: 1, E C Bowles, Grahamstown. South African-bred bull, Hereford, Ayrshire, or Devon, under 2 years: 1, C Adams & Son, Tarkastad. South African-bred Channel Island bull, Guernsey, Jersey, or Alderney, over 2 years: 1, W H Pigott, Highlands. Kerry bull, over 2 years: 1, E J Pike, Grahamstown. Afrikander bull, over 2 years: 1, W J Ford, Kasouga. South African-bred bull, other than the foregoing, over 2 years: 1, J C Fletcher, Grahamstown. Imported shorthorn cow: 1, G King & Sons, Bedford. Imported Devon cow: 1, Mrs E Brook, Grahamstown, h c, C Adams & Son, Tarkastad. South African-bred Friesland cow: 1, S C van Rensburg, Grahamstown; 2, E C Bowles. Grahamstown. South African-bred shorthorn cow: 1, G King & Sons, Bedford; 2, Mrs L E Barrand, Grahamstown. South African-bred Devon cow: 1, Mrs E Brook, Grahamstown. South African-bred - Ayrshire cow: 1, A Shackleton, Grahamstown. South African-bred Channel Island Cow, Guernsey, Jersey or Alderney; 1, Joseph Dicks, Grahamstown; h c, Mrs E Brook and E Lark, Grahamstown, Kerry cow: 1, E J Pike, Grahamstown; 2, T H Humphrey, Grahamstown.

Afrikander cow: 1, A J Connock, Grahamstown. South African-bred cow, other than the foregoing: 1, L B Webber, Vaal Vlei. Group consisting of 1 bull and 2 cows or heifers, any age over 1 year, bred by exhibitor: 1, G King & Sons, Bedford. Pen of 3 Friesland heifers, not less than 18 months nor more than 3 years old: A J van Niekerk, Somerset East; 2, Webb Bros, Grahamstown Pen of 3 shorthorn heifers same ages and conditions: 1, G King & Sons, Bedford; 2, Webb Bros, Grahamstown. Pen of 3 heifers, other than the foregoing, same age and conditions: 1, Webb Bros, Grahamstown. Single heifer, any breed, under 2 years: 1, L C van Rensburg, Grahamstown; 2, A Shackleton, Grahamstown. Pen of South African-bred milk cows, in milk: 1 and 2, J A van Rensburg, Somerset East. Team of trek oxen, not less than 14, to be exhibited in yoke: 1, J C Reddin; 2, A T Davies, Rokeby Park.

CHAMPION PRIZE.—For the most perfect bull in the yard: Mrs W Distin Middelburg, CC.

The slaughter stock shown was in good condition, several big framed Afrikander oxen exciting much comment.

In pigs too there was a good display, but there was not a great deal of competition. The Poultry section too, was not equal to last year's, though a good many breeders from a distance sent exhibits.

The Butter making competition fell through altogether, but there was a good exhibit in the class for the best 5lbs of fresh butter, with plenty of competition. No cheese was shown.

Agricultural Produce was another weak section, largely owing to the drought, no doubt, but several good samples of potatoes, and lucerne hay were on view, and a good lot of table pumpkins.

The Fruit was good, but unfortunately the prizes were listed for the most part for collections. The fruit industry of these districts has not yet reached that stage of importance when separate prizes can be offered for named varieties. But it is growing so fast that the committee might consider this for the next show.

There were a good many miscellaneous items which attracted the attention of the public, but none that vied with the implements and machinery. The section included one of the best displays ever seen at a country show and the enterprise of the firms who went to the expense of arranging these interesting exhibits deserves every encouragement.

PORT ELIZABETH AGRICULTURAL SOCIETY.

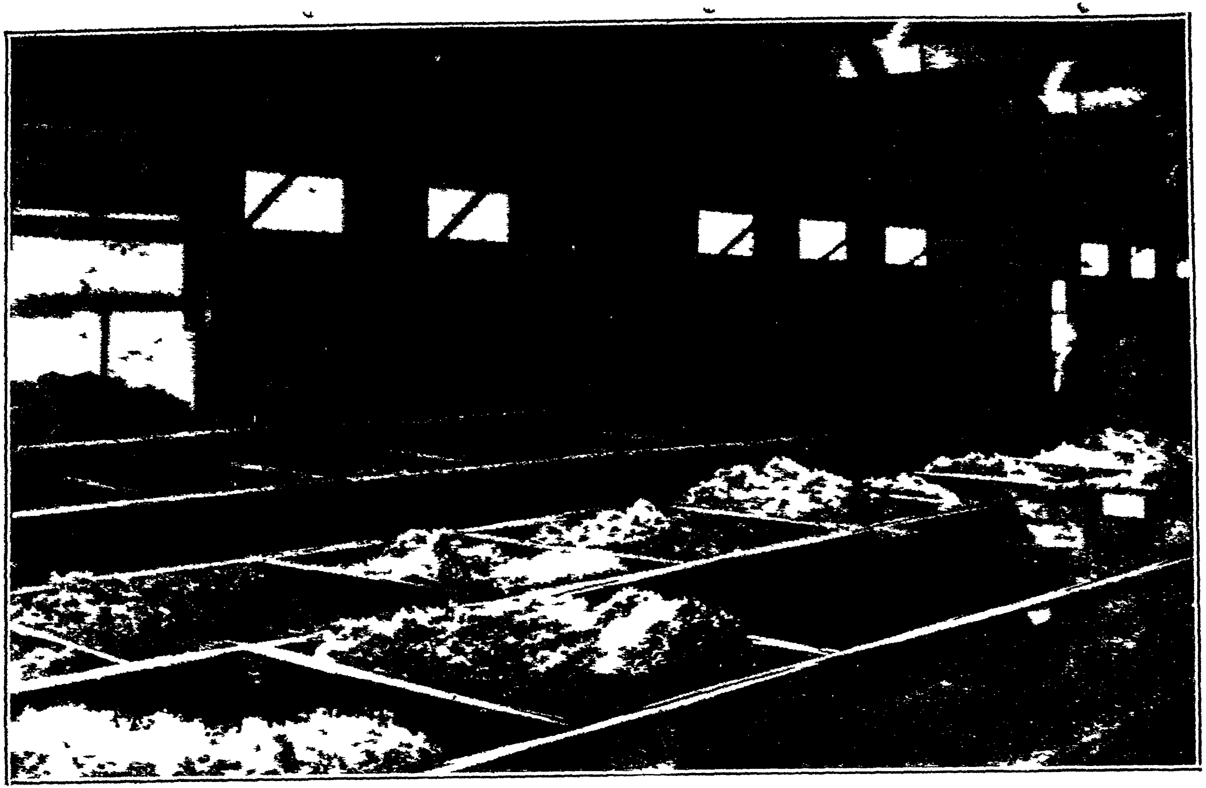
THE 1905 SHOW.

The Port Elizabeth Agricultural Society has a weakness for establishing "records," with the evident desire of breaking them. This year its wildest ambitions in this direction must have been gratified, for all previous records of entries, attendance or any other prominent feature of the Annual Agricultural Show were quite surpassed. The huge yard, which covers upwards of sixty acres of land, was actually crowded on more than one occasion; there was scarcely a pen or a stall vacant when the live stock exhibits were all brought in, and special extra accommodation had to be provided for many of the other sections. A great improvement to the yard is the addition of a huge iron building with a shady verandah running its full length. This was used to house produce exhibits such as wool, mohair, ostrich feathers &c., and a portion was partitioned off as a refreshment room.

The new showyard is not beautiful, but it is improving, and if the committee can only succeed in inducing a few trees to grow and provide a little shade and shelter, it will be a vast improvement. At present it is very bare and the huge iron buildings and sheds spread about give it a glary appearance which is far from comforting to the eye. But the yard has an exceedingly business-like appearance. There is an air of activity everywhere, and this is largely accounted for by the magnificent array of machinery in motion, agricultural implements &c., which are among the first features of the Show to catch the visitor's eye. In implements and machinery Port Elizabeth surpasses every show in the Colony, and it is doubtful if a larger or better display is to be seen outside the larger European, American and Australian Centres. Those firms who arrange these exhibits deserve well at the hands of the farmers, for it must have cost thousands—in the aggregate—to bring this section to its present state of perfection. Anyone interested in agriculture could spend the whole of the Show period among the implements and machinery and then come away without having seen everything.

In the stock sections the Horse, Merino Sheep and Angora Goats were each a magnificent array of quality and value. There are few agricultural shows in the world where one can see four thoroughbred stallions equal to Conroy, Oakdene, Leisure Hour and Chesney, in the judging ring at the same time, with Kempton Hoo, thrown in as a makeweight. In a class where a horse like Conroy has to take

Ostrich Feathers at Port Elizabeth Show—The Exhibit of Prime Whites



Wool and Mohair Exhibits at the Port Elizabeth Show third place, a distinguished son of Bend Or,—where Leisure Hour, with all the prestige of his St. Simon parentage behind him as well as his personal claims to distinction, is placed second; with Chesney, the son of Melna, the distinguished Australian who was cast ashore in Table Bay from the wreck of the Thermopylae, placed first, one wonders where the end will be. Taking a sordid view of this class it is interesting to realise that the actual cash value of the five competitors might be anything between £8,000 and £10,000. The Sheep and Goat sections were quite as remarkable. There was scarcely a Merino or an Angora on the show this year that would not have been a prize winner ten years ago. And to-day they come up in battalions to compete and be judged. In fact the woolled sheep and Angoras are going ahead so fast that it is difficult for the judges to find those subtle differences which mean success or failure for the exhibitor. And again we are beginning to hear the cry for standardisation and judging by points. We attach the prize lists of the principal sections with the judges' reports thereon. The latter are so full that little could be added to them.

WOOL

3,000 lbs grease wool, grass veld: J H Botha, 3 (no 1st and 2nd.) 1,000 lbs grass veld grease: George Blaine, 1; T T Hoole, 2. 1,000 lbs mixed veld, or other than special Karroo or grass veld grease: E J Niland, growth of wool, 12 months, 1; Frederick William Southey, growth of wool, 10½ months, 2; T W King, 3. 20 fleeces of Merino wool in grease, grown in the Karroo, unskirted: R Rubidge, growth of wool, 12 months, 1. 20 fleeces of Merino wool in grease, grass veld: George Blaine, 1; T T Hoole, 2. 500 lbs Hoggetts' grease wool, grass veld: George Blaine, 1. 500 lbs Hoggetts' grease wool, mixed veld, or other than special Karroo or grass veld: Frederick William Southey, growth of wool, 15 months, 1; E J Niland, growth of wool, 12 months, 2: G King & Sons, special prize recommended. 500 lbs Lambs' wool, not more than 9 months' grown by the exhibitor: J C Rippon, growth of wool, 9 months, 1. 500 lbs scoured Merino wool: Gubb & Inggs, 1.

Special Prizes.—For wool grown in the Orange River Colony the merchants of Port Elizabeth offer five prizes:—1,000 lbs grease wool of Merino sheep, properly locked and skirted, rolled in single fleeces, at least 10 months' growth, grown by the exhibitor: J E Wilmot, sen, 1; J P de Wet & J P B Cilliers, growth of wool, 12 months, 2 and 3. Entire 20 fleeces of Merino wool in grease: J C Faure, growth of wool, 12 and 15 months, 1 and 2.

Judges' Report.—The judges in presenting their report regret the scarcity of exhibits and the poorness of competition in the individual classes. Geo Blaine's exhibit, which gained first prize in Class 5, was of superior quality, lustrous and sound, whilst both Messrs Blaine and T Hoole's exhibits were not without Hoggett fleeces. Mr Rubidge's exhibit, which gained first in Class 7, was a little irregular in quality, but well grown and sound, the judges recommending the grower to eradicate burr weed. Mr G Blaine's exhibit in Class 8 was deep grown, sound and of good quality. Judges: O Bracht, H Frielinghaus, H Hall, Jas Lamb, O Kiessig, A Muller.

MOHAIR.

100 fleeces of mohair, grown in the Karroo, exhibited intact as shorn off the goats, to combine length, fineness, lustre and evenness of growth, rolled in single fleeces: R Cawood, 1; Theophilus Bros, 2. 100 fleeces, of mohair, grass veld, same conditions: G King & Sons, growth of wool 6 months, 1; R Cawood, growth of wool, 8 months, 2. 500 lbs of mohair, grown in the Karroo, combining length, fineness and lustre, properly locked, skirted and rolled in single fleeces: R Cawood, growth of wool, 8 months, 1; A B Hobson, growth of wool, 8 months, 2. 500 lbs mohair, grass veld, combining length, fineness, and lustre, properly locked, skirted, and rolled in single fleeces: R Cawood,

growth of wool, 6 months, 1. 250 lbs kids' hair, grown in the Karroo; same conditions: A B Hobson, growth of wool, 7 months, 1; R Cawood, growth of wool, 7 months, 2; R C Holmes, special prize. 150 lbs kids' hair, grass veld, same conditions: R Cawood, growth of wool, 7 months, 1; S B Hobson, 2.

JUDGES' REPORT.—Exhibit 2 (R Cawood) in Class 20 was well bred, superior quality, good lustre, free from kemp, but somewhat irregular in length. Exhibit 1 (Theophilus Bros) is the same class was of good length and lustre, but uneven in quality and partly kempy. Exhibit 7 in Class 21 (G King & Sons) was a very good one, combining length, quality and lustre. In Class 22, exhibit 13 (R Cawood) was really a grand one, very soft handling, combining length, quality and lustre, a very desirable style of hair. Exhibit 24 Class 23 (J T Drake) was a very superior exhibit, combining length, quality and lustre, and very soft hanling. Exhibit 29 was a very nice one of beautiful quality and lustre, well bred and free from kemp, but lacking in length. For this a special prize was recommended. Exhibit 25, Class 36, was a very superior exhibit. combining solidity, deep growth, quality and lustre, well bred and free from kemp. Your judges congratulate the Society on the excellency of the exhibit generally which shows a marked improvement on previous years, both in quality and care in getting up for exhibition, and can only regret that there were not a greater number of entries. Judges: Messrs G Matson, W H Connell and S Bryan.

OSTRICH FEATHERS.

Variety of ostrich feathers, not less than 2 lbs in all, and to be of not less than 10 distinct kinds of not less than 3 oz each: Ockert Fourie, 1; Oscar E G Evans, 2; W R Southey, 3. 1 lb prime white feathers: Oscar E G Evans, 1; Ockert Fourie, 2. 1 lb long blacks: P & P Rabie, 1; G L White & A White, 2. 1 lb long drabs: Oscar E G Evans, 1; G L White & A White, 2. 1 lb feminas: Ockert Fourie, 1; Oscar E G Evans, 2. 1 lb white tails: W E Murray & Sons, 1; W R Southey, 2. 1 lb femina tails: Oscar E G Evans, 1. 1 lb fancy (byocks): Oscar E G Evans, 1. For the entire plucking, unsorted of 10 ostriches, 5 cocks and 5 hen ostriches: Oscar E G Evans, 1.

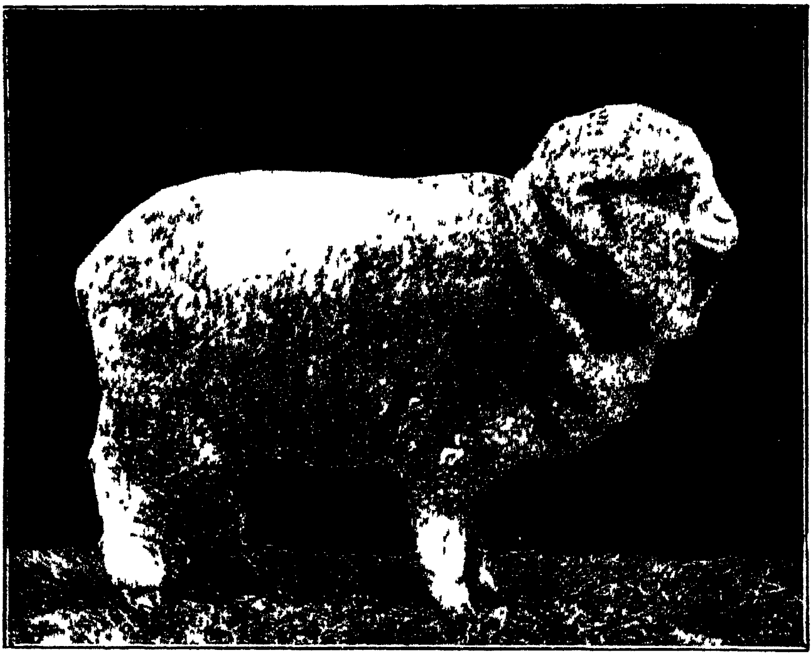
JUDGES' REPORT.—Mr O E G Evans, who obtained first prize in Clause 27, submitted a close thick flue feather free from any defects, and carrying a heavy tip, whilst Mr O Fourie's exhibit, which took 2nd prize, contained some very good feathers, but they were partly narrow for the length and defective. Generally speaking, these entries were not up to show standard. Of Mr O Fourie's exhibit in Class 30, we think it is exceptionally good, being a well-grown, very long, broad fine flue feather. No 51 (Mr O E G Evans) is a good broad tail of light colour, and worthy of 1st prize. No 56 (Mr O E G Evans) is a good exhibit, being well-grown, broad and thick flue, not having that tendency to softness of quill frequently noticeable in this description. We regret the meagre competition in this class. Taking the section throughout, we do not consider the exhibit up to the standard of quality shown last year. In some of the classes we regret that there are so few entries, notably with that of Class 35 (unsorted), Class 33 (byocks), and Class 32 (fem. boos), in each of which there appears only one entry, and we also especially regret the entire absence of any entry in Class 34 (spadonas). We strongly wish to emphasise here the desire of those connected with the ostrich feather trade to see larger exhibits in the "unsorted class," to which is attached a particular importance.

MERINO SHEEP.

FINE WOOLLED.—Imported pure bred Merino ram, not under 4 tooth: T T Hoole-growth of wool, 11-2, shorn 3-5-04, 1; J C Sieberhagen, 2; J H King, 3. South African, bred Merino ram, not under 4 and not over 6 tooth: G King & Sons, 1; J C Sieberhagen, 2; J H King, 3. South African-bred Merino rams, 2 tooth, and not under 12 months: Frederick William Southey, ram No 37, L E "Taxpayer," 1; J H King, 2; S J Marais, 3. South African-bred Merino, full mouth: J H King, 1; C Adams & Son, 2; J G Sieberhagen, 3. Pen of 3 South African-bred Merino rams, 2 tooth, and not under 12 months' old: Frederick William Southey, ram No 47, L E, "Golden Fleece," 1; J G Sieberhagen, 2; G King & Sons, 3. Imported pure bred Merino ewe, not under 4 tooth: C Adams & Son, 1; T T Hoole, 2; G A Rogers, 3. South African-bred Merino ewe, 2 tooth, and not under 12 months: Frederick William Southey, ewe No 79, L E, by "Prince of Wales." 1; J H King, 2; G A Rogers, 3. South African-bred Merino ewe, not under 4, and not over 6 tooth: G A Rogers, 1; S J Marais, 2 and 3. South African-bred Merino ewe, full mouth: J H King (champion ewe), 1; J H King, 2; S J Marais, 3; J G Sieberhagen, h c. Pen of 3 South African-bred Merino ewes not under 4, and not over 6 tooth: G King & Sons, 1 and 2. Pen of 3 South African-bred Merino

Champion Ram (Fine Woolled) at Port Elizabeth Show, the property of Mr J H King, of Tarkastad

Champion Ram (Robust Woolled) at Port Elizabeth Show, the property of Mr J H King, of Tarkastad



Champion Ewe (Robust Woolled) at Port Elizabeth Show, the property of Mr. S. J. Marais.

Champion Angora Ram, Port Elizabeth Show, the property of Messrs. J. Hobson & Son.

ewes, full mouth: G King & Sons, 2; Painter & Leonard, 3. (No first). Champion ram and ewe; fine-woolled type. Champion ram, J H King (43). Champion ewe, J H King (124).

ROBUST WOOLLED.—Imported pure bred Merino ram, not under 4 tooth: Frederick William Southey, No 5, "His Majesty" (imported), bred by W Gibson & Sons, Scone, Tasmania, 1; C Adams & Son, 2; Frederick William Southey, No 10, "Van Diemen" (imported), bred by W Gibson & Sons, Tasmania, 3. South African-bred Merino ram, not under 4, and not over 6 tooth: J H King, 1 (champion class); G A Rogers, 2; C Adams & Son, 3. South African-bred Merino ram, 2 tooth, and not under 12 months: S J Marais, 1; J H King, 2; J G Sieberhagen, 3. South African-bred Merino ram, full mouth: Painter & Leonard, 1; G A Rogers, 2; C Adams & Sons, 3. Pen of 3 South African-bred Merino rams, 2 tooth, and not under 12 months' old: G A Rogers, 1. Imported pure bred Merino ewe, not under 4 tooth: Frederick William Southey, ewe, No 4, "Lady Hillmore" (imported), bred by W Gibson & Sons, Scone, Tasmania, 1; Frederick William Southey, ewe No 2, "Royal Queen" (imported), bred by W Gibson & Sons, Scone, Tasmania, 2; S J Marais, 3. South African-bred Merino ewe, 2 tooth, and not under 12 months: S J Marais, 1; Frederick William Southey, ewe No 76, L E, by "Prince of Wales," out of No 57, L E, from original importations, 2; S J Marais, 3. South African-bred Merino ewe, not under 4, and not over 6 tooth: J H King, 1; S J Marais, 2; J H King, 3. Best South African-bred Merino ewe, full mouth: S J Marais, 1; S J Marais, 2; J G Sieberhagen, 3. Pen of 3 South African-bred Merino ewes, not under 4, and not over 6 tooth: G A Rogers, 1; Painter & Leonard, 2. Pen of 3 South African-bred Merino ewes, full mouth: J G Sieberhagen, 1; C Adams & Son, 3. (No second). Champion ram, J H King; Champion ewe, S J Marais.

PERSIAN SHEEP.

Pen 1 Persian ram and 5 Persian ewes, pure bred, not under 2 tooth (7 entries): S M Gadd, 1; J P de Wet & J B Celliers, 2; J P de Wet & J B Celliers, c. Pure-bred Persian ram (8 entries), second best ditto: J P de Wet & J P B Celliers, 1: S M Gadd, 2; J P de Wet & J P B Celliers, h c Pure-bred Persian ewe (6 entries): S M Gadd, 1; S M Gadd, 2; Hougham Abrahamson, v h c; J P de Wet & J P B Cilliers, h c. 3 pure-bred Persian rams, not over 2 tooth (8 entries): S M Gadd, 1; J P de Wet & J P B Cilliers, h c. 3 pure-bred Persian ewes, not over 2 tooth (8 entries): J P de Wet & J P B Cilliers, 1; S M Gadd, 2; Hougham Abrahamson, v h c; Hougham Abrahamson, h c.

ANGORA GOATS.

South African-bred ram, not under 4 tooth, and not over 6 tooth: Cawood Bros, age 2 years, 8 months, shorn 20-1-04, 1; Percy E Hobson, growth of hair, 10½ months, 2; Percy E Hobson, growth of hair, 15¼ months, 3. South African ram, 2 tooth: J H Hobson & Son, growth of hair, 13½ months, 1; A B Hobson, Rhodes, growth of hair 14 months, 2; Cawood Bros, age 1 year 8 months, shorn 20-2-04, 3. Ram (registered in Stud Book): Percy E Hobson, growth of hair, 11¼ months, 1. South African bred ram, full mouth: J E Hobson, 1; A B Hobson, growth of hair 11½ months, 2; R C Holmes, 3. Pen of 3 South African-bred rams, not more than 2 tooth: A B Hobson, growth of hair, 14 months, 1; A B Hobson, growth of hair, 14 months, 2; A B Hobson, growth of hair, 14 months, 3. Pen of 3 South African-bred rams, under 4, and not more than 6 tooth: J E Hobson, age 2 years 6 months, shorn 16-4-04, 1; R Cawood, age 2 years 6 months, shorn 22-4-04, 2. Pen of 10 ram kids: G King & Sons, age 8 months, 3; (no 1st and 2nd prize awarded.) Champion Class; J Hobson & Son, exhibit 20 in Class 66. Ewe (registered in Stud Book): Percy E Hobson, 1; A B Hobson, 2. Pen of 3 South African-bred ewes, 2 tooth: A B Hobson, 1; J Hobson & Sons, 2. Pen of 3 South African-bred ewes, not under 4 and not more than 6 tooth: Cawood Bros; J Hobson, 2. Pen of 3 South African-bred ewes, full mouth: J E Hobson, 6 tooth, 1. South African-bred ewe, 2 tooth: J Hobson & Son, 1; A B Hobson, 2. South African-bred ewe, not under 4 and not more than 6 tooth: A B Hobson, 1; A B Hobson, 2. Pen of 10 ewe kids: G King & Sons, age 8 months, 1.

HORSES.

STALLIONS.—Imported thorough-bred stallion, combining blood, power, and symmetry, and not under 4 years old: 1, Henry Nourse's through-bred stallion, "Chesney," by Malna; 2, Abe Bailey's thoroughbred imported stallion, "Leisure Hour," age, 8 years 3 months; 3, De Beer's Consolidated Mines, Ltd., thoroughbred bay stallion, "Conroy," age, 12 years, sire Bend Or, gr sire Doncaster; h c Abe Bailey's thoroughbred stallion "Kempton Hoo," age 4 years. South African thoroughbred stallion, combining blood, power, and symmetry, and not under 4 years old (1 exhibit): 1, J P de Wet & J P B Cilliers' S A thoroughbred stallion, "Rockland," by Whittington, out of Peerless, age 10 years. Imported Cleveland stallion (3 exhibits). A silver cup, value £15 15s., presented by George Scoby, Cleveland Bay Stud Farm, Beadiam Grange, Nawton, York, England, will be awarded to the winner in Class 83. The cup must be won three times in succession, but not necessarily by the same horse: 1, James Rawbone's "Broomgrove's Pride"; 2, Mac G Brown. Imported hackney stallion (4 exhibits): 1, Arthur Forbes's "Lord Donnington" (for sale); 2, J S de Wet's "Matchless," aged; 3, J P de & J P B Cilliers' "Cavalier II," by Cavalier. South African-bred hackney stallion, not under 4 year (3 exhibits): 1, G van Zyl's dapple grey stallion "Adjutant II," by Cavalier; 2, Francis Carr Bayly; 3, S J de Wet's "Cavalier III." Arab stallion (4 exhibits): 1, Col T E Hickman; 2, H Wylie; 3, R H Struben.

Mares.—Imported thorough-bred mare, combining blood, power, and symmetry not under 4 years (5 exhibits): 1, Abe Bailey's "Miss Collingwood;" 2, James Rawbone's "Miss Vera;" 3, Abe Bailey's "Eleanor." South African thoroughbred mare, combining blood, power, and symmetry, not under 4 years (5 exhibits): 1, Henry Nourse's "Pearl Queen," by Pearl Diver; 2, Alexander Robertson; 3, De Beer's Consolidated Mines, Ltd, bay brood mare "Hero," age 8 years. Imported Cleveland mare (2 exhibits): 2, James Rawbone's "Maid Mary," 1891, sire Wild Hero, dam Maid Marian, age 14 years Imported hackney mare (5 exhibits): 1, Arthur Forbes's "Lady Denmark," 1040, HSB, 1892; 2, Arthur Forbes's "Lady Day," 12802. HSB, foaled 1897; 3, J P de Wet & J P B Celliers' "Gondola," age 9 years. South African hackney mare, not under 4 years (2 exhibits): 1, Arthur Forbes's "Lady Day's Duchess," age 5 years; special prize, J S de Wet's "Gold" [illegible]

Entire Colts.—South African thoroughbred entire colt, not more than 2 years off combining blood, power and symmetry (4 exhibits): 1, James Rawbone's "Sir Henry," foaled 1902, sire St Garlath, dam Hamtonia; 2, De Beer's Consolidated Mines, Ltd, "Shamrock"; 3, De Beers Consolidated Mines, Ltd, "Birdcatcher." South African-bred entire colt, not more than 3 years off, suitable for draught or saddle (8 exhibits): 1, De Beers Consolidated Mines, Ltd, "Glenroy"; 2, De Beers Consolidated Mines, Ltd, "Sir Bevis"; 3, Paul J de Wet's "Matchless II." South African-bred Cleveland colt, not more than 2 years off (1 exhibit): 1, James Rawbone's Cleveland colt, foaled 1902, sire Ingmanthorpe II, dam Belladonna. South African-bred hackney colt, not more than 2 years off (5 exhibits): 1, G H van Zyl "III"; 2, Paul J de Wet's "Budget," by Cavalier; 3, Arthur Forbes's "Lord Black" (for sale).

Fillies.—South African thoroughbred filly, not more than 3 years off, combining blood and symmetry (1 exhibit): 1, De Beers Consolidated Mines, Ltd, "Bayadora." South African thoroughbred filly, not more than 2 years off, combining blood, power and symmetry (4 exhibits): 1, James Rawbone's "Sappho"; 2, De Beers Consolidated Mines, Ltd, "Daisy"; 3, De Beers Consolidated Mines, Ltd. "Grace Conroy." South African-bred filly, not more than 3 years off, combining blood, power and symmetry (6 exhibits): 1, De Beers Consolidated Mines, Ltd, "Pansy"; 2, J S de Wet; 3, James Rawbone's "Celia," age 3 years 4 months. South African-bred Cleveland filly not more than 2 years off (1 exhibit): 1, James Rawbone. South African-bred Hackney filly, not more than 3 years off (8 exhibits): 1, J S de Wet; 2, J P de Wet & J P B Celliers' "Sunlight"; 3, Arthur Forbes's "Donnington Day II" (for sale).

Riding Horses.—South African-bred riding horse, stallion or gelding, specially adapted for farm use, not under 4 years, to be exhibited under saddle (6 exhibits): 1, F C M Wienand, age 8 years; 2, S Whitehead; 3, G King & Sons' "Gordon Moscow." Imported riding horse, mare or gelding, specially adapted for farm use, not under 4 years (3 exhibits): 1, S M Gadd, "Nettle"; 2, W Dawson Brown, "Lass"; 3, J M Robertson, "Eccles." South African-bred riding horse, stallion, mare or gelding, for own use, not under 4 years (4 exhibits): 1, G King & Son: 2, Francis Carr Bailey; 3, Cuthbert Ed Mayo. Imported riding horse, stallion, mare or gelding, for town use, under 4 years (15 exhibits): Miss Hirsch, "Kitty"; 2, Arthur Forbes, "Dolly Grey"; 2, Smith Hudson; h c, Capt H T McClebban.

Draught and Carriage Horses.—Pair of draught horses, suitable for wagon, trolley, dray, or Scotch cart, combining power, symmetry and action, not under 14·2 hands, to be exhibited in draught (4 exhibits): 1, Heazlett & Hall; 2, Smith Hudson; 3, Foxcroft Bros. Pair of horses, suitable for Cape cart or travelling purposes, combining power, symmetry and action, to be exhibited in draught: De Beers Consolidated Mines, Ltd, "Silvertail" and "Elsie"; 2, J J Maynier. Pair of carriage horses, combining power, symmetry and action, over 14·2 hands (4 exhibits): De Beers

Angora Ram, winner of registered prize at Port Elizabeth Show, the property of Mr. P. Hobson, the first animal entered in the S.A. Stud Book.

6-Tooth Angora Ewe, the winner of Registered Prize at Port Elizabeth Show, the property of Mr. P. E. Hobson.

Consolidated Mines, Ltd, "Guy Wilkes" and "Hambrino": 1, Katzenstein's Livery Stables; 3, Dr Maythew.

Pair carriage horses, combining power, symmetry and action, 14·2 hands and under: 1, Sydney A White. Trotter, to be exhibited in draught: 1, F Katzenstein. Heavy draught horse, suitable for cart and trolley purposes (4 exhibits); 1, James Brent; 2, Walter Duncan; 3, Heazlett and Hall. Pair of ponies, not exceeding 14·2 hands: 1, John Sime Neave; h c, Eugene B Crawford. Buggy or dog-cart single harness horse (8 exhibits): Mrs A M Bowhill, "Lazy Alice"; 2, Fred Savory, "Lucy"; 3, Katzenstein's Livery Stables; h m, Mrs Oliver E Page's "Milo."

SADDLE PONIES.—South African-bred pony, 14 hands or under, to be exhibited under saddle (8 exhibits): 1, William Mitchell Pringle; 2, D & A Jacobson & Co; 3, Loftus N Magennis.

LADY'S HACKS.—South African-bred lady's hack, to be ridden by a lady: G King & Sons' "Prince"; 2, Miss Olive M Martin's "Brinck."

JUDGES' REPORT.—In Class 81, the Judges had great difficulty in placing the horses owing to their exceptionally good merit. The winner "Chesney," was quite one of the best sires in their opinion they had ever judged, therefore it was no discredit to the second horse, "Leisure Hour," to be beaten, the winner having better bone and thighs. In class 82 the judges had no difficulty in bringing the imported and Colonial together in finding the winner in "Chesney." The best imported hackney stallion, No. 26, in Class 84, was quite a useful stamp—good mover and manners. In class 85, the winner, No. 37, a grey horse, was in in the opinion of the judges a magnificent animal, with enormous bone and substance, and a very true mover, and deciding between the winners in Classes 84 and 85, the award was given to the imported bay horse, which has already been described. The judges were undecided for some time as to which was the superior animal, and in their opinion the imported horse was the better mover. In Class 85, for Arab stallions, the first prize horse, No. 46, was in the opinion of the judges quite as good as ever could have been shown in the country. No. 48 was also full merit. In Class 88 the prize mare, No. 67, was much above the average quality in symmetry as shown in this country, with beautiful head, neck and shoulders, combining great quality. No. 76 in Class 89, was of the very highest possible class, and a great credit to South African-bred horses. Class 91, in the opinion of the judges, was an exceptionally good one. No. 88, which took first prize, had extraordinarily good propelling powers and fine action. To No. 89, daughter of the winner, the judges awarded second prize. There were only two exhibits in Class 92, one being a pure Hackney, and the other not, but the judges suggested that a special prize be awarded to the latter animal, a bay mare (No. 102), owing to her fine qualifications, in their opinion as likely to breed cavalry remounts. The winner, No. 101, was quite a useful animal, a good mover, and with a good foal at foot. No. 119, the winner in Class 94, was a beautiful small colt, with perfect symmetry and action combined. In Class 96, No. 127, was in the opinion of the judges quite one of the best of its breed exhibited to-day, and was awarded first prize. Class 102 was a very creditable lot; the winner, No. 171, was quite first-rate, symmetry and characteristic of a pure hackney. Class 103 was also a very fine class. No. 199 in Class 105 was a beautifully balanced horse, with extraordinarily good bone and substance all over, and was awarded first prize. In deciding between the winners of Classes 105 and 106, the Society's certificate was awarded to No. 207, although the judges were not unanimous. The prize-winner was Miss Hirsch's bay mare, which had quite an exceptionally good head, with very comfortable riding action. Class 109 was a very good one, and the prize-winners, exhibit 239, were a beautiful pair of browns with beautiful action and manners. The first, second and third prize-winners were a credit to their owners. Class 114 was in the opinion of the judges an exceptionally good one; the winner, No. 298, was a very high-class mover. No. 312, the first prize-winner in Class 115, was a brown pony quite lovely in make and shape. No. 318 had perfect manners and would carry a boy learning to ride. In Class 116, No. 323, was a beautiful ridinghorse. No. 319, the second prize-winner, lacked the size and general appearance of the winner.

CATTLE.

BULLS.—Imported Friesland bull, 4 to 8 years: 1, R Featherstone; 2, J J Maynier. Imported Friesland bull, 2 to 4 years: No award. South African bred Friesland bull, over 1 and under 2 years: No award. Imported Shorthorn bull, 4 to 8 years: 1, Elsenburg Agricultural College "Manor Favourite"; 2, Mrs W Distin Imported horthorn bull, 2 to 4 years: 1, John Dewar's "Pom-Pom"; 2, R A Struben. South African bred Shorthorn bull, 4 to 8 years: G King & Sons. South African bred Shorthorn bull, 2 to 4 years: Elsenburg Agricultural College's "Rodger"; 2, G King & Sons. South African bred Shorthorn bull, over 1 and under 2 years: 1, John Dewar's "Gerald"; 2, G King & Sons. Imported Ayrshire bull, 4 to 8 years: 1, James Rawbone's "Osborne of Auchenbrach." Imported Ayrshire bull, 2 to 4 years: 1, William Allan's "Barcheskie Crown Jewel." South African bred Ayrshire bull, 2 to 4 years: 1, James Rawbone's "Dairyman IV"; 2, E C Bowles. South African bred Ayrshire bull, over 1 and under 2 years: 1, James Rawbone's "Milkman"; 2 James Rawbone's "Somerset V." South African bred Devon bull, over 1 and under 2 years: 1, C Adams & Son. Imported Hereford bull, 2 to 4 years: 1, Abe Bailey's "Chain Armour." Africander bull, 4 to 8 years: 1, F C Bayley. Africander bull, over 1 and under 2 years: 1, C G Lee. Imported Jersey bull, 2 to 4 years: Elsenburg Agricultural College. South African bred Jersey bull, 4 to 8 years: 1, P R Heugh; 2, J P Holmes & Co.

Cows.—Imported Friesland cow, 3 to 8 years: 1, J J Maynier's "Princes Moselle"; 2, John Gardner. South African bred Friesland cow, 3 to 8 years: 1, Elsenburg Agricultural College's "Cleopatra"; 2, Nelson Bros. Imported Shorthorn cow, 3 to 8 years: 1, Elsenburg Agricultural College's "Primula"; 2, Elsenburg Agricultural College's "False Lady'.; vhc, John Dewar. South African bred Shorthorn cow, 3 to 8 years: 1, G King & Sons; 2, Nelson Bros. Imported Ayrshire cow, 3 to 8 years: 1, James Rawbone's "Swankie II." South African bred Ayrshire cow, 3 to 8 years: 1, James Rawbone's "Lottery III"; 2, James Rawbone. Imported Devon cow, 3 to 8 years: 1 and 2, C Adams & Son. Imported Hereford cow, 3 to 8 years: 1, Abe Bailey. South African bred cow of any other breed than the foregoing, or cross-bred, 3 to 8 years: Mrs S H Boss's "Minnie"; 2, Nelson Bros. Afrikander cow, 3 to 8 years: 1, F C Bayly; 2, C G Lee. Imported Jersey cow, 4 to 8 years: P R Heugh South African bred Jersey cow, 4 to 8 years: P R Heugh. South African bred Jersey cow, 2 to 4 years: 1, Elsenburg Agricultural College's "Nancie"; 2, Nelson Bros. Pen of 3 South African milch cows, in milk: 1, Nelson Bros. Pen of 3 South African milch cows, in milk, *bona-fide* bred by the exhibitor: 1, G King & Sons.

Heifers.—Pen of 3 Shorthorn heifers, bred by the exhibitor: 1 and 2, G King & Sons Pen of 3 Ayrshire heifers, bred by the exhibitor: 1, James Rawbone. Pen of 3 Africander heifers, bred by the exhibitor: 1 and 2, Halse Bros.

Bull and cow, under 6 years, either imported or Colonial bred: 1, James Rawbone; 2, John Dewar.

Champion Prizes.—The most perfect imported bull in the yard, gold medal, value £10: Elsenburg Agricultural College's "Manor Favourite" The most perfect South African bred bull in the yard, gold medal, value £10: Elsenburg Agricultural College's "Rodger."

Judges' Report.—The cattle section, although not so large as on some previous occasions, which was to be expected, considering the prolonged drought, which affects this class of stock more than any other, yet is, on the whole, very good. There was a lack of competition in several of the classes, but, with one or two exceptions, the exhibits were good, and well deserved the prizes awarded. The two imported Friesland bulls, 4 to 8 years, were both good animals. and the judges had some difficulty in deciding upon their relative merit. The second prize animal has fine symmetry and a good fore quarter, but the first prize animal we considered better in quality, and superior in the hind quarter. He was a little weak behind the shoulder. There was one entry for imported Friesland bulls under 4 years, but he was well deserving of the prize. The aged imported Shorthorn bull is an animal of fine quality and symmetry, and was an easy winner in his class This bull was also awarded the champion prize for imported bulls. The exhibit for the best imported Shorthorn bulls under 4 years. with the exception of the first prize, animal No. 40, were not a strong class. For the South African bred Shorthorns under 4 years, the first prize bull, No. 49, is a very handsome animal of fine symmetry and quality, and shown in the pink of condition. There were two promising young bulls exhibited in the class for South African bred Shorthorn bulls under 2 years, There was only one entry in the two classes for imported Ayrshire bulls, but they were both good animals, good representatives of that hardy milking breed. The same remark applies to the prize-winners in South African bred Ayrshire bulls.

There was only one entry for the best imported Jersey bull, but he is an animal of beautiful quality and symmetry. In the class for imported Friesland cows, the first prize animal, No. 193, is an animal of excellent quality and symmetry. In the class for imported Shorthorn cows there were five entries. Three of these were considered by the judges as the most perfect specimens of the breed that they had seen exhibited at any Colonial show. The first prize cow, 214, is almost perfect in symmetry, but the second prize cow 213 has the indications of the best milker, although lacking a little the symmetry of the other. To the cow 211 the judges gave high commendation, and considered her well worthy of a prize. The South African bred Shorthorn cows were good animals, but were not in very good condition The Ayrshire cows were a good exhibit, especially the first and second prize animals, Nos. 229 and 230 respectively, in the class for South African bred cows, 229 is really a beautiful animal.

There were a number of good milch cows shown in the class for South African bred cows of any other breed or cross-breed. There were also two very fine cows in the class for South African bred Jersey cows. No. 296, which got the first prize, is a very sweet animal of beautiful quality and symmetry. There were some excellent milch cows shown in the classes for the best pens of milch cows. The pens of 3 Shorthorn heifers were also a good exhibit, but the pen of Ayrshires, 231, were the best exhibit in these classes.

In the group classes the judges missed the Frieslands, which used to take such a prominent position at previous shows. This breed has lost the great support given to it by the late Mr. Mellish The judges, after considerable discussion, awarded first prize to the Ayrshire group No. 351, the Shorthorn 351*a* being placed second In the champion classes, the Shorthorn carried off both prizes, No. 32 for imported bulls and No. 49 for South African bred bulls. They are both very fine animals. There were two half-bred Kerry and Friesland cows exhibited, both indicating excellent milking qualities There were also two very nice Ayrshire heifers exhibited, the owner not having a third to make a pen. There were some very good Afrikander cattle shown, but there is nothing deserving special mention.

Judges: D Hutcheon, W E Murray, M Hull, E J MacMillan, and J C Fletcher.

THE MARKETING OF FRUIT, WINE, VEGETABLES, &c.

Action by the Agricultural Department.

Recommendations of Joint Committee appointed by the Western Province Agricultural Society and the Western Province Horticultural Board.

On the 7th of March, the Under Secretary for Agriculture addressed the following letter to the Secretary of the Western Province Horticultural Board and the Secretary of the Western Province Agricultural Society:—

DISPOSAL OF FRUIT, WINE AND VEGETABLES.

SIR,—I am directed by the Secretary for Agriculture to say that some time past the Government has had under its consideration the difficulties experienced by farmers in the disposal of their produce. It seems probable that these difficulties may be attributable to some extent to causes which can be overcome. Amongst these causes are the following:—

(*a*) The fact that non-perishable articles, such as prunes, dried raisins, dried apricots and preserves of all kinds, are not produced by any one farmer in very large quantity; and that the merchant does not care to buy such articles in small quantity unless a continuous supply can be maintained, preferring to stock in such a manner as to be able to supply his customers constantly with the same article.

(*b*) In many cases the farmer does not pack his produce in the way in which the merchant has been in the habit of obtaining it, and therefore the home grown article does not compete satisfactorily with the imported.

(*c*) The sale of such perishable articles as vegetables and fruit is by no means satisfactory to the farmer, an undue share of profit going to the middleman, whilst the consumer has to pay very high prices.

(*d*) The need of developing markets for the sale of Cape wines in Home and Foreign markets.

The Secretary for Agriculture is anxious to arrive at some workable scheme which will enable farmers to co-operate for the sale of non-perishable produce; and has under consideration the establishment of a depot aided by Government for the sale of non-perishable produce, a possible remedy for the present conditions of sale of perishable produce, the development of markets in South Africa and elsewhere for the sale of Cape Wines, and means for instructing the farmers in the best methods of packing their produce.

Under these conditions, and before placing any sum upon the Estimates, the Secretary for Agriculture would like to have the advice of some representatives of those most interested, and would be glad, therefore, if your Board and Society would select, at as early a date as may be possible, two or three representatives to discuss with him, and with a similar number of representatives from the Western Province Horticultural Board and Agricultural Society, the best means of aiding the farmer in the disposal of his produce to the best advantage.—I have &c.

(Sgd.) Charles Currey.

Under Secretary for Agriculture,

The suggestion was accepted by both those bodies and the following joint committee appointed:—The hon. C. W. H. Kohler, M.L.C., (chairman); Messrs. P. Ryan, P. R. Malleson, Louis Cloete, H. Meyers, R. Starke, H. C. Gird, R. J. Bulmer, and J. Rawbone.

REPORT OF THE COMMITTEE.

The committee presented the following Report dated April 8th:—

The Honourable the Secretary for Agriculture,

Sir,—In connection with the letter from your Department, No. c/335, dated 7th March, and in continuation of the interview which you had with the Committee appointed by the Western Province Agricultural Society and the Western Province Board of Horticulture, I am to inform you that the committee in question have gone carefully into the question of co-operation among farmers in the production and disposal of wine, fruit, vegetables and similar produce; and beg to submit the following recommendations:—

Markets for Fruit and Vegetables.

From evidence received, there is little doubt that great improvement is necessary in the marketing arrangements in various centres and that fruit and vegetable growers are labouring under grave disabilities in this respect. As observed in your letter under reply, a large proportion of profit goes to the middleman, while the producer receives comparatively little and the consumer has to pay high prices. This is especially noticeable in the case of the Cape Town market, which, instead of being one of the best, so far as producers are concerned, is about the least profitable market in the country. The principal, or one of the principal reasons, for this state of affairs is that the market is in such an out-of-the-way place and conducted in such a manner that it is solely patronised by dealers, whose only idea is of course to buy as cheaply and sell as dearly as possible, while there is more than a suspicion that there is collusion between some of the market agents and the buyers.

The committee feel that it would be of very great assistance if a wholesale and retail market could be established in some central position in Cape Town, easy of access to the general public. They understand that the Government propose expropriating a site on the Parade between the Opera House and the Railway Station for the purpose of extending the General Post Office; and the committee would strongly recommend for your consideration whether it would not be possible to convert the ground floor and basement of any building which may be erected, into a wholesale and retail market for fruit, vegetables and flowers. This would make an admirable site and is practically the only available space in the city.

In the event of this suggestion being carried out, the committee would recommend that the market be placed under municipal control and all auction sales placed in the hands of a properly qualified market master, to whom produce could be consigned. It is further recommended that, in auction sales, provision should be made for separate accommodation for dealers and the general public. In order to obviate the undue profit of the middleman and bring the producer and consumer into closer touch, it is recommended that, in allotting the stalls, preference should be given to bona-fide producers, especially to combinations of producers. In order to secure the best results, it would be advisable to keep the retail part of the market open on certain nights of the week, say until 10 p.m.

It would also tend to greatly assist farmers if the Municipalities could be induced to set aside some open place in different centres on different days of the week, where farmers could send their produce for disposal out of hand—say, for instance, one day Greenmarket Square, one day Riebeek Square, one day some open place at Sea Point, one day some open place in the Gardens, one day in district No. 6.

DRIED FRUITS, RAISINS, &c.

In connection with the dried fruits and raisin industry, the committee fully recognise the necessity for co-operation in order to secure uniformity of product and to place the industry on a proper mercantile basis. They realise, however, that in many, if not the majority of cases, the fruit will have to be dried by the farmer on his farm before being sent to a central depot; and they think the Government could render very valuable aid by giving instruction to farmers in the most approved methods of drying and evaporating. There are several persons in the country who are now turning out a first class article and the Government might be able to avail itself of their services without going abroad. The Government should also take into consideration the question of assisting towards the establishment by farmers on co-operative lines of central depots in such districts as may be desirable, where fruit could be properly processed and packed, under the supervision of skilled operators, and further toward enabling the management to make advances against fruit sent to the depots, as many farmers would be unable to avail themselves of the facilities provided unless some proportion at least of the price were paid on delivery—they could not afford to wait for some months until the fruit had been actually disposed of.

JAMS.

While on this subject, the committee do not think it would be out of place to mention that Cape Jams are getting a bad name, which is injuriously affecting their sale, owing to some of the manufacturers selling jam which does not consist entirely of the fruit indicated on the label, but to which considerable quantities of vegetable matter, such as pumpkin, Kaffir watermelon, &c., have been added. Glucose is also being largely used instead of sugar. If the existing Adulteration Act is not sufficient to meet the case, they would recommend that the necessary amendments in the Act should be made to prevent such action on the part of manufacturers and to ensure that all jams be sold true to name.

WINE.

The committee have gone very fully into the question of co-operation as applied to wine making and consider that combination is highly desirable in order to ensure large quantities of a uniform quality being produced. which is of primary importance in building up a trade. The principles of co-operation have now been thoroughly ventilated among wine farmers and the time seems opportune for the Government to assist the movement, as far as lies in its power. The committee suggest that Government assistance should be directed towards the following objects.

(1) To assist in finding out suitable and experienced men to take charge of co-operative wineries.

(2) To assist farmers, by means of loans at a low rate of interest, in the erection of wine cellars on co-operative principles and the purchase of the necessary fustage and in making advances against delivery of grapes or must at the central store.

The committee would not advocate the laying down of hard and fast rules that all wine should be made at the central store, but would leave it to the management of the central wineries to decide on the merits of each case. In some instances it might be found practicable to insist that all grapes be delivered at the central store and converted into wine there; in other instances, owing to distance, this would not be feasible, and farmers would have to deliver their must for subsequent treatment. It would, however, be necessary, especially in the first years of their existence, for the Government to assist any co-operative wineries which may be established to enable them to make advances against grapes or must so delivered, as very few farmers would be in a position to wait for their money until the wine had properly matured and was in a fit condition for sale.

The Committee also feel that it would serve to stimulate the output and hasten the end it is desired to attain, if the Government were to offer a bonus for the production, within a stipulated period, of large quantities of properly matured wine of a uniform character and good quality, by any *bona fide* wine grower or combination of wine growers. This bonus would probably induce the smaller growers to co-operate; and any bonus which might be awarded could be deducted from any advances which might have been made for the erection of central wine cellars, etc.

It would be necessary to make it quite clear that quality of the wine would be of primary importance and that no bonus would be awarded for an inferior wine.

MARKETS FOR CAPE WINES.

The committee strongly realise the necessity for developing the home markets, as South Africa will undoubtedly be for many years the principal consumer of Cape wines; but at the same time it is necessary to look ahead for an outlet when the country is in a position to export; and it seems desirable to aim at producing a type of wine which will not only be pleasing to the South African palate, but will be able to hold its own in foreign markets.

In pursuance of this idea, the committee think it would be an excellent plan if the Government were to appoint a commercial agent to travel round the markets of the world, with samples of bulk quantities of approved matured wines, to ascertain the types of wines suitable to different countries, so that Cape growers can have an idea of what they should produce. At the same time, such agent could affect sales where possible, with the idea of relieving the market here which is apparently overstocked, and, as a result, is exercising a depressing effect upon the wine industry generally. It would be necessary to appoint a reliable and expert committee to carefully examine and approve of all samples before they were handed over to the commercial agent.

To turn again to the question of South African consumption, it may be pointed out that a considerable amount of raw spirit, of the very worst type is still being smuggled into centres where natives are largely employed, with demoralising effects to the consumers; and the committee would throw it out as a suggestion whether, in view of the apparent impossibility of preventing the consumption of liquor by natives in these centres, it would not be preferable to permit the drinking of light Cape wines.

As regards brandy, the committee would wish to place on record their opinion that now that an Excise has been placed on Colonial spirits, it is only fair and reasonable that the duty on imported spirits should be levelled up, so as to make the difference the same as it used to be, and that, if the Customs Convention will not admit of the duty being increased, an Excise should be levied on all imported spirit consumed in the country.

They would also like to draw the attention of the Government to the fact that a number of dealers, who are benefiting by a state licence, are refusing to stock or sell the Colonial article, and that some legislation is needed to meet the case.

DAIRY INDUSTRY.

Though the question of the Dairy Industry was not among those specially mentioned by you, the committee feel that they cannot let this occasion pass without referring to the primary importance of encouragement being given to the Dairy Industry in any scheme which the Government may bring forward.

There is absolutely no reason why, even if unable to compete with other countries in the English markets, the Colony should not be able to produce sufficient for South African requirements and thus do away with the reproach of having to send out of the country every year hundreds of thousands of pounds for butter and cheese. The establishment of co-operative creameries in other countries, notably Australia and Denmark, has been attended by highly successful results, and there seems full reason to anticipate similar benefit from their establishment here. The committee strongly advocate that the Government should render all possible help in its power, whenever any desire is expressed by farmers, towards initiating the co-operative system at suitable centres, of which there are several both in the Eastern and the Western Province. The Government could very materially assist farmers in securing the services of suitable men to take charge of co-operative creameries and by making advances at a low rate of interest for the purpose of putting up the necessary buildings, plant and machinery.

In Australia, the bonus system has been largely responsible for the present satisfactory state of affairs, and it seems likely that the offer of a bonus here would serve as a stimulus to production.

It may be argued that at the present moment fresh butter can be readily sold at a price higher, probably, than in any other part of the civilised world, while the producer is already receiving a bonus in the shape of an import duty; but these conditions have obtained for years past, and unless some special inducement is held out, it seems probable that no steps will be taken to overtake the enormous deficiency between supply and demand. It must be understood that the committee do not advocate the payment of a perpetual bonus, but only the payment of a certain amount per pound to any co-operative dairy producing not less than a certain minimum of good quality within a stipulated time. This principle would also apply in the case of the wine industry.

The committee would further remark that cheese-making would form a very important industry in parts too remote from railway communication to permit of the establishment of dairies.

Cheese-making has been tried in certain parts of the Colony, but with varying success, and it needs practical demonstration to shew that it can be conducted as a paying commercial speculation.

It is suggested that the Government might start a cheese factory in one of the large cattle districts, too remote from market for butter making purposes, and where milk could be supplied by the farmers at a low rate. There is no reason why, under proper management, such an enterprise could not be conducted on a paying basis, and when it had served the purposes of demonstration, no doubt the farmers in the neighbourhood would be prepared to take it over on a co-operative basis, so that the Government would incur no loss.

Railway Tariff-book and Railway Rates.

The committee would bring to your notice that, although there is a difference of ½d. per ton per mile in the freight on Colonial and imported produce, this is found in practice to afford insufficient protection to the Western Province grower, but the Colonial article is at a distinct disadvantage on the up-country markets, owing to the imported article being able to be sent through the port of entry most convenient to the market in which the stuff is to be disposed of.

They would also draw attention to the urgent need for revision of the many anomalies existing in the Tariff Book. As an instance, wood-wool for packing fruit is conveyed at third-class rates, while boxes in shooks imported for precisely the same purpose are charged at second-class rates. They would also ask whether spraying material could not be put on the same basis as sheep dip as regards duty and railway carriage.

They would further ask whether it would not be possible to reduce the rate on manures to the same level as for agricultural produce; and would point out as an argument in support of this concession, that for every ton of manure conveyed over the railway, considerably more than a ton is re-consigned in the shape of produce, while increased output increases the available purchasing power of the farmer and thus indirectly recoups the Government, as practically all his requirements have to be conveyed over the railways.

Whilst admitting the large concession made in the conveyance of kraal manure from Karroo districts, it may be pointed out that, even at the present rate, this manure costs on an average 8d. per basket landed on any farm at or south of Wellington; and anyone with a knowledge of farming will realise that this is a prohibitive price.

In conclusion, I may say that the recommendations embodied in the above report have been arrived at after full deliberation; and it is trusted that they will receive the most favourable consideration of the Government. The Committee will be most happy to meet the Government to discuss or amplify their suggestions if you will be good enough to appoint some convenient time.—I have, etc.,

(Sgd.) Chas. W. H. Kohler,
Chairman of the Committee.

BONE MEAL FOR CATTLE.

The interesting letter of a Keiskama Hoek correspondent, printed herewith, in which he relates his experience of the value of bone meal, strongly supports the claim which Mr. Hutcheon, C.V.S., has always made for it, viz., that when given in sufficient quantity it is not only an effective preventive of Lamziekte and Stijfziekte, but it is one of the most valuable artificial foods that a stock farmer can supply to his farm animals of all kinds.

The letter reads as follows :—

Mr. Hutcheon may be interested in my experience with Bone Meal for Cattle.

Early in December, 1903, one of my cows in good condition, two months calved and in full milk, either lay or fell down on the way home one evening and could not be induced to get up again. On the following morning she was lying fifty yards from where she lay the night before, having apparently got to her feet and staggered forward, falling and rising two or three times by the way. She died on the fourth day without again having got up. Two of my neighbours who saw her opened, pronounced the cause of death to have been Gall-sickness.

Early in January, 1904, two other cows also in full milk, began to lose flesh rapidly and appeared to be stiff in the loins. On consulting the *Agricultural Journal* I concluded that Lamesickness was the cause of illness, I also thought that the cow that died the previous month suffered from the same cause. Bone meal was not obtainable locally and a fortnight elapsed before a supply could be got. By that time one of the cows was reduced almost to a skeleton and was so weak that every time she lay down I feared she would not be able to get up again. The other cow was not quite so much reduced in flesh and strength, but was stiffer in the hindquarters. She took to the bone meal and salt almost at once and very soon an improvement was noticeable. The weaker cow however, could not be induced to go near the meal. She seemed to detest the smell of it. When a little was put into her mouth, she trembled all over, and when it was put in front of her, she bellowed. She was then shut up in a stall and fed on forage, a supply of bone meal and salt being left in the manger. In a day or two she began to taste and was soon licking it greedily.

Before winter set in both cows were fat, and have remained so all through the drought. Both have just calved fine strong well nourished calves and I feel quite convinced that even had they lived they would have had no calves this season but for the bone meal.

The other cattle were also supplied with the mixture and soon learned to lick it, sometimes fighting for possession of the box on coming into the kraal. There has been no further appearance of stiffness and the general condition and sleek appearance of the cattle has through all the long drought been better than in any previous year.

As to the quantity given, I may state that the second 200 lb. bag of bone meal since the end of January, 1904, has just been finished by eleven (11) head of cattle, which gives a daily allowance of almost exactly 1½ ounces per head. At first the mixture was given two-thirds bone meal and one-third common salt, but as the drought continued the salt was increased to equal parts.

REVIEWS.

"THE A.B.C. OF BEE CULTURE," by A. I. Root. Published by the A. I. Root Co., Medina, Ohio.

The above work is probably the most exhaustive publication on bee culture that is published, and the latest edition, which has recently come to hand, is the most complete yet put out. It is revised and almost re-written by E. R. Root, the son of the original founder and contains information down to the most minute details of this attractive industry. Of course, the work deals primarily with American experiences, but it does not call for a great genius to adapt them to the conditions prevailing in this Colony. We often receive enquiries from readers of the *Agricultural Journal* on points connected with bee culture, which show that interest is growing faster than most people imagine, in that industry. To all who are seeking information we can confidently recommend this book. It is in the form of a cyclopœdia, is profusely illustrated and well bound in cloth and boards. We note that it is stocked in Cape Town by Mr. T. Maskew Miller, of Adderley Street, who retails it at 7s. 6d.

"THE CEREALS IN AMERICA," by Thomas F. Hunt, M.S., D.Agric., Professor of Agronomy in the College of Agriculture, Cornell University. New York: The Orange Judd Co. London: Kegan Paul, Trench, Trubner & Co.

Prof. Hunt has compiled a valuable and interesting book under the title of "The Cereals in America," and one that will attract the attention of both the farmer and the student. It presents a concise statement of the results of experimental research affecting the successful production of cereals in the United States and is well and carefully illustrated with upwards of 100 new and original drawings. In a word it is a text book written by a capable authority. The subject matter includes an accurate, comprehensive and succinct treatise of the cereals—wheat, maize, oats, barley, rye, rice, sorghum (kaffir corn) and buckwheat, as related particularly to American conditions. Where germane to the subject, however, results of foreign experience are stated. The author has made a comprehensive study of the topics treated, drawing freely from the publications of the United States Department of Agriculture, comprising chiefly the publications of the Office of Experiment Stations and recognized journals related to agriculture.

"SUCCESSFUL FRUIT CULTURE," by Samuel T. Maynard, formerly Professor of Horticulture at the Massachusetts Agricultural College. New York: Orange Judd Co.

Yet another American work on fruit culture, this time written from the standpoint of the practical fruit grower, who wishes to make his business profitable. It is projected on a very practical plan for while giving local conditions as affecting the American grower, it covers the entire practice of the industry and contains much that is valuable to those interested in the business anywhere. Separate chapters are devoted to the various fruits, including sub-tropical varieties, fruit-growing under glass, the propagation of fruit trees and plants, insect pests and fungus diseases. In fact, it is thoroughly comprehensive and contains a mass of practical information which is of great value. To the new beginner, or the man who wishes to grow a little fruit for home consumption this little book, which by the way is excellently illustrated, should be of great assistance. It includes everything from the starting of seed or cutting, to the marketing of the fruit, and is based on wide experience and practice.

"FARM GRASSES OF THE UNITED STATES," by W. J. Spillman, Agrostologist, United States Department of Agriculture. New York: Orange Judd Co.

Professor Spillman, in this work, gives a concise account of the grasses of the United States, which is practically a *résumé* of the experiences of the farmers of that country. The value of the book is that the information is put in such a form as to tell farmers just what they want to know about the grasses which have an actual standing on the farms of the United States. The author gives particulars of the methods followed by the most successful raisers of grass in America, and there is no attempt to confuse the reader by the use of scientific names, though every common name used has its botanical name given in the index for the purpose of identification. The book is excellently illustrated.

"POULTRY FEEDING AND FATTENING," by G. B. Fiske. New York: The Orange Judd Co.

The author of "Poultry Architecture," "Poultry Appliances," etc., has put out another book of interest to practical poultry raisers who look to the industry as a profit-earning proposition. In the present little book he gives a wealth of detail as to the handling of poultry for market, which is compiled in a handy form and should command a ready sale. The practices quoted are not confined to America, but include the best of most successful poultry-raising countries of the world. As a result the reader may select that which suits his conditions best. The book is copiously illustrated and very instructive.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

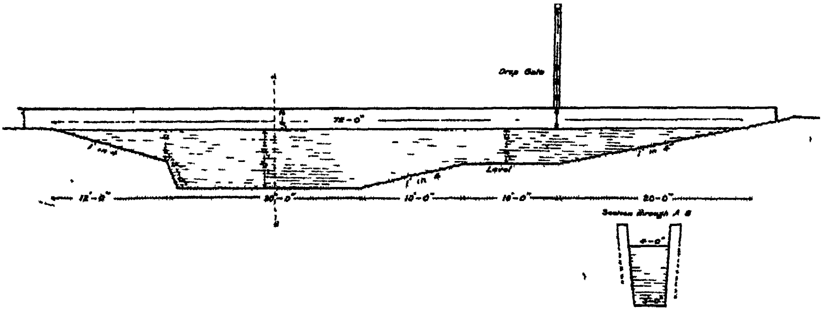
All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

Cattle Dipping Tanks.

To the Editor AGRICULTURAL JOURNAL.

SIR,—In the *Agricultural Journal* for August, 1904, drawings are given of a Cattle Dipping Tank as approved by the Agricultural Department.

After witnessing and taking part in a considerable number of dippings of stock and after discussing the subject of dipping with other fellow farmers and with some of our most experienced Scab Inspectors, Mr. Fletcher has built a Tank somewhat after the following sketch;—



We are convinced that the haste with which cattle are rushed through the Tanks is a very serious mistake. In many cases the animals are scarcely ten seconds in the bath and I believe most farmers now accept this decision.

To enable the man in charge of the dipping operations to be able readily to detain cattle in the bath for any given time, say a minute or more Mr. Fletcher has built a Tank approximately as shewn in this sketch. No roofing or cover is provided consequently the cattle go into the bath much more readily.

We consider that it is very preferable to fence the Tank in with fine wire netting so as to prevent small animals getting at the Tank when it is not in use.

A level space about 10 feet long with a depth of about 3 feet 6 in. of dip is provided with a drop or swing gate down to the water level so that cattle may stand with their bellies well covered as it is chiefly there that the most troublesome ticks are found.

We are advocating this modification of your Tank as we feel convinced that it is in the interests of the farmers that ample time should be allowed for cattle to remain in the bath, and that dipping operations should not be rushed as they generally are at present.

We are convinced that a much better result from dipping will be obtained where this is attended to - Yours, &c.

G. D. ATHERSTONE,

Manager, Fletcher's Albany Tick Dip.

Grahamstown, March 24.

We are all liable to err, even with the best of intentions The design published and approved by the Agricultural Department is believed to be the best for several reasons. The rest in the above plan is a doubtful innovation. A good long swim would be far better. One thing wanted is to get at the ticks round the head and ears and under the tail as well as those on the belly and we doubt if the Fletcher plan will have that effect However, it is all open to demonstration.

Sluits and Dongas.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Anyone can grow trees successfully, if they can be protected from cattle and fire, and are thinned out sufficiently in very dry situations. But whether all the trees that are likely to be planted by this and the next generation will have the slightest influence on the rainfall may well be doubted Somehow I cannot imagine Cape Colony with a humid climate in the past or in the future. The character of the vegetation does not warrant such an idea. As for the vleis, I don't see what they had to do with it. Here 90 per cent. of them are on the hill-tops, generally close to the steepest side, and if they were not mud volcanoes, what else could they be?

However, what I want to point out is, that where dongas occur, the land of geologically recent origin, is still in a state of unstable equilibrium, and that the quantity or quality of its rainfall is of little consequence.

All over the hills and valleys, formed by upheavals and by the erosion of rain and stream, there lies a layer of blue clay of almost uniform thickness. Scattered through it, and forming a distinct layer beneath it, there is small shot like gravel, which sometimes in the valleys forms rusty or metallic blocks or a thin sheet of rock. Mostly this clay and gravel lie unconformably on the superficial strata of slate and sandstone, but in certain areas there is interposed another layer—typically a sandy material of a yellow colour peppered with the same gravel and showing no signs of stratification. This layer may be of great thickness, and wherever it occurs there you find dongas. The permanent stream or occasional stormwater finding its way down the valley in course of time, wears through the blue clay and cuts down through the less coherent material, till it reaches the old rock bottom. So long as there is abundant vegetation, there may be little lateral extension, but as soon as the grass is burnt in the dry seasons, the clay cracks near the brink, and allows the next rains to percolate through the crevices and wash away some of the underlying sand. Soon the unsupported clay falls in, and in the end we have a typical donga, with rocky bottom, almost perpendicular sides, and here and there pyramids of the sandy material capped by blocks of blue clay.

Now to make dams and transverse barriers seems like fighting against the laws of nature. When the impervious clay is gone, the stream will not remain on the surface, but must seek down to the next impervious stratum An actual dam would only increase the wash-out and collapse of the banks, and transverse barriers to arrest the silt would mean a succession of flats and falls. There would be a scooped-out hollow below each fall, and without constant supervision the stream would one day find a way round the end of the barrier.

The better way would be acquiese, not to seek to make water flow at an artificial level, and to plant the banks with creeping grasses, &c , wherever it is possible, and guard against fire.—Yours &c.,

P.H.W.

Tembuland, March 23rd, 1905,

Lifting Water for Irrigation.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Under the above heading I notice a letter from Mr. David Black, Tsitsa Bridge, in your issue for March. At my farm "Rooi Drift," on the Fish River, I have had similar difficulties to contend with as Mr. Black describes, and as I have every reason to be highly satisfied with the plant I have put down, perhaps a description of same would prove useful to that gentleman and to others who are in doubt as to the best means of irrigation to employ.

I have had installed a 20 h.p. Hornsby-Akroyd oil engine, with a five-inch centrifugal pump, and the same size delivery. The river banks are very high and the pump is fixed on a concrete bed twenty feet above the water, the engine house being on the top of the bank above flood height. The point of delivery is 500 feet from the river and 57 feet higher than the water in the river.

The stream from the pipe keeps four boys leading the water, and the eight acres now under cultivation can be flooded in four hours. I am now clearing about thirty acres, and reckon the plant will irrigate far more than that in the day, as my pump will lift about 425,000 gallons in the twelve hours. The method I adopt is to lay out the beds nice and flat, so that the water, led through the trenches can flow easily to every part.

What I like about the plant is that the engine, once started, can be left entirely, and with no more care than is needed to occasionally oil it. This is an immense convenience as well as a saving in expense. In answer to Mr. Black's questions I may say I consider the engine and pump I have are unapproachable, simple to work, and requiring no skilled man to manage. The pump will lift twenty-five feet. I consider the Centrifugal Pump cannot be beaten for both strength and good results. I should like to add that my plant was supplied by Messrs. Reiners, von Laer & Co., of Port Elizabeth, and I think it is always best to have skilled opinion as to position of plant and power of engine, etc., as these details differ with different circumstances, and the agents are always willing to give attention to questions as to these details. Once the plant is properly installed, the attention and work is comparatively nothing, and the cost of running is extremely small.—Yours, &c.,

JOHN QUINN.

Grahamstown, March 29, 1905.

Surface *vs.* Artesian Waters.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In your issue of March, 1905, I see a letter from Mr. E. Masters *re* sluiting causes and effects, etc., and I must say that it is very interesting, but as it is a most serious question, the way our waters are sinking through these perpetual droughts, I shall be exceedingly glad if Mr. Masters or any hydraulic engineer would give me an explanation on the above subject. As far as I know we have nothing but surface waters in the flat country which of course is dependent on rain. These surface waters all rise behind the dolorite beds from the drainage out of the water-bearing rocks, consequently we generally find mostly all the farms in the poorts, where the dolorite is at its lowest, and the longer the drainage is above that spot the longer the water will remain strong at the spring where it rises. But what causes the waters on the very summit of these high mountains (where there is absolutely no drainage to feed them) to keep flowing through the severest droughts Is it perhaps that nature has so created the earth, that these waters originate from the sea and, condensed by the subterranean fires, are ultimately driven along subterranean crevices for miles away at a depth of perhaps 2,000 feet. If so (as I have seen in the *Wide World Magazine*) in Australia they have bored to the depth of 1,800 feet and struck the artesian waters which flow up with such rapidity they could scarcely stop it again, would it not pay the Government of this Colony to get out an expert to examine the surface here for such indications? I have an idea that drilling for surface waters increases the power of repulsion and that such artesian waters will improve the attraction of our rains.—Yours &c.

B. J. BURGERS.

Palmietfontein, April 10.

The Hippopotamus in the Colony

To the Editor, AGRICULTURAL JOURNAL

SIR,—Looking through the Departmental Notices in the March number of your valuable *Journal* I find it stated there that "Hippopotami are not to be found in the Colony," to which I beg to offer the following facts which do not appear to support the above statements.

In 1894 and the three preceding years I was living on the Orange River and had occasion to observe quite fresh spoor scarcely an hour old of two or three hippopotami at a place called Marvis about twenty miles below Schuitdrift on the Orange and again another time in the mouth of the Kunnaap, a tributary of the Orange from the Great Namaqualand side.

At still another time several of these animals were seen although not by me personally disporting themselves in the Orange only a few miles below Schuitdrift.

Again about twelve years ago one hippo was shot at Ramansdrift on the Orange and on two later occasions no less than five of these animals were seen by two spectators independently from each other.

It is owing to the inaccessibility of their lairs only that these relics of a past age have not become extinct and I consider it my duty to inform you and through your our government of my observations with the hope of seeing protection extended to these animals also.—Yours, &c.,

G. G. A. MOLLAT.

Concordia, Namaqualand,
21st March, 1905.

The Hippopotamus is protected in the Colony.

"Vrot-pootjes" in Onions

To the Editor, AGRICULTURAL JOURNAL

SIR,—Can you or any of the readers of the *Journal* tell me the cause of the disease in onions called "vrot pootje"? Does it come through infected seed, or has the soil or season anything to do with it?—Yours, &c.,

FARMER.

This disease is largely due to climatic changes, according to the seasons.

Bird Guano

To the Editor AGRICULTURAL JOURNAL

SIR,—I have numberless sparrow hawks sleeping on my blue gum trees, and under the trees is becoming covered with their droppings. I should be glad if you through your journal would let me know if I could not make valuable use of it, and how to use the same.—Yours, &c.,

C. B. CUMMING.

The only way is to use it as other guano is used. Scrape it up, spread it on the soil to be manured, and watch the result. We do not think it would be of very great value.

Weirs Across Streams.

To the Editor, AGRICULTURAL JOURNAL

SIR,—I see in the January *Journal* where Mr. Southey builds weirs across the river. What I want to know is, has a man the right to make more than one dam in the river on his farm? If so, what about his neighbour below him?—Yours, etc.,

HOPE.

April 8, 1905.

Land Measurement.

To the Editor AGRICULTURAL JOURNAL.

SIR,—An answer through the *Journal* to the following questions will greatly oblige

What is a morgen of ground? I was told by a surveyor 100 x 100 yards is about a morgen. Would 100 x 50 yards be half a morgen? Would 50 x 50 yards be half a morgen? Would 100 x 75 yards be three-quarters of a morgen? Would 25 x 25 be a quarter morgen, and would 75 x 75 yards be three-quarters of a morgen? Should 50 x 50 yards be about an acre, or should it be 70 x 70 yards, as stated in the prize essay on lucerne.—Yours, etc.,

FARMER.

Prieska, March 29, 1905.

A Cape morgen is always taken roughly as 100 x 100 yards. 100 x 50 would therefore be half a morgen (roughly); 50 x 50 be a quarter of a morgen; and 100 x 75 would be three quarters of a morgen. 25 x 25 yards, by the same calculation, would be one-sixteenth of a morgen. For farm purposes the English acre is usually taken as 70 x 70 yards, but the nearest calculation in yards is 69 x 70—this comes within 10 square yards of the actual measured acre which is 4,840 square yards. The Cape morgen contains 2⅛ English acres.

Measuring the Flow of Streams.

To the Editor AGRICULTURAL JOURNAL.

SIR,—I would be glad if you could inform me of the simplest method for measuring the amount of water flowing through a small open furrow in a given time?

What apparatus, etc., I would require to use, what fallacies are liable to occur, and for what irregularities one must allow? What is the capacity of a cubic foot in gallons?—Yours &c.,

GEO. B. WILKINSON.

Vosburg, C.C.

The Director of Irrigation (Mr. W. B. Gordon) has compiled a small pamphlet on the above subject, giving the required information. A copy has been posted to our correspondent. There are 6¼ gallons in one cubic foot, and 1 gallon weighs 10 lbs.

Hairball in Calves.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Articles have appeared in the *Agricultural Journal* from time to time with reference to the accumulation of hairballs in calves, and as a case has occurred that appears to be somewhat at variance with the accepted theory that the hair is taken in through the mouth only, I will feel obliged for information in a known case of one hairball, an inch in diameter, being found in a calf that was dropped during the night and found dead in the morning?

I may add that I am absolutely certain that the ball of hair, the same colour as the mother, was found in the stomach of the calf, and will be glad to know, through the *Journal*, how the accumulation took place.—Yours &c.,

A. R. BROOKS.

East London, March 14.

Our correspondent is a little vague, though his assertions are so positive. The evidence in support of such a statement must be a little more precise before it can be accepted, as it claims to prove that the hair found its way into the calf's stomach through the navel. This is a little far-fetched surely.

The Eradication of Scab.

To the Editor, Agricultural Journal.

Sir,—Mr. Southey says "the opinion that only lime and sulphur should be used to eradicate scab, is not Mr. Southey's only, but is the growing opinion among all the most enlightened and progressive farmers." Also, "If the Minister for Agriculture, when shaping his new Scab Act, insists upon farmers cleansing their sheep of scab leaving them free to choose from amongst the good, bad and indifferent dips, of which they know absolutely nothing," &c. Does he seriously mean to say that he can answer for the opinion of "all," or any considerable number of farmers so ignorant of dips, as to "know absolutely nothing," after long years of Scab Act operation and education in the matter by Inspectors and other opportunities? An opinion to be worth taking must necessarily, on this subject, be from a man's own knowledge and experience I beg respectfully to submit to Mr. Southey that he cannot from his own knowledge substantiate either statement.

That lime and sulphur cures scab is not disputed. Its disadvantages are cost of time, labour, utensils and fuel in preparing it; uncertainty as to strength of the product, owing to variable qualities of lime and other causes. And the most serious fault of damaging the wool On this latter point we must accept manufacturers' evidence which is indisputable. The contention that dipping during the first month after shearing does not damage wool, so commonly made by advocates of this dip, is valueless until we are shewn by them a practical, inexpensive method of confining the occurrence of scab to that one month, which is, of course, impossible. Lime and sulphur does not prevent re-infection any longer than a good imported dip. Before the first Scab Act came into operation I was working for the late respected grower of the noted Cloverdale clip, and he discarded lime and sulphur and other dips in favour of Cooper's, and kept to it until the eradication of scab under the Act rendered dipping unnecessary. My opinion after doing all the dipping, was that Cooper's Dip prevented re-infection for a longer period than lime and sulphur Lime and sulphur and another non-poisonous dip are much vaunted by Inspectors who used to get awkward queries re sheep lost by carelessness in using Cooper's; but for the man who wants to eradicate scab from his sheep *and farm*, Cooper's fills the bill. It has become indispensable as a dose for prevention and cure of summer gallsick (or "geilziekte"). "It saves," as an opponent of Cooper's Dip remarked, "hundreds of sheep for me." It is also most useful for ticks on cattle; used with a knapsack sprayer, one small packet is sufficient for over 60 cattle, destroying the ticks. The prices given by Mr. Southey certainly shew the value of non-scabby wool, 7d. per lb. for 12 months' wool, shorn November, 1904, may be good, but we do better here with sheep which have neither had scab nor been dipped for generations bred by men against whom no record of scab exists in Scab Inspectors' books. The King William's Town price for my 12 months' wool off such sheep November, 1904, was 9½d., unskirted, drought-stricken wool; hundreds had died of poverty.

In discussing the question of the eradication of scab in this country, some essentials are too often overlooked. It is absolutely necessary to relieve Inspectors of the onus of cleansing scabby flocks *and farms*. It can be done effectually only by determined vigilance of the man on the spot, and takes months to effect by reason of the many sources of infection existing on such scabby farms and, probably, in the neighbourhood; a few of such sources of infection are kraals, sleeping places, sheds or shearhouse, shearers' clothing, skins, fences or fencing posts, trees or rubbing places and gates. On this account any simultaneous dipping must be, and always will be, a farce, and a most unnecessary waste where dip is given free. *It takes months to cleanse a farm*, and negligent owners can only be induced to do so through their pocket.

It is also absolutely necessary to strictly enforce quarantine. Our districts are nearly always clean; we have good Inspectors, who loyally do their work, but over and and over again, through the laxity of the Act or its administration, scab is introduced. One instance will suffice. In this ward scab has been practically unknown since a buyer in 1902 introduced Queenstown sheep and scab, till during this drought thousands of Queenstown sheep were sent into this district; one lot into the midst of our clean farms, with scab. The Queenstown Inspector had not notified our Inspector of removal of such sheep, and on prosecuting the owner, who lived in Queenstown district, the Court decided that the resident black herd was the proper party to prosecute. It is most discouraging to a good Inspector and a crime against ourselves

The present Act permits scab. The fines are too low to seriously influence negligent owners whose scabby sheep are a standing menace to all who hold clean farms and stock. I would suggest granting licences to all who own and wish to keep scabby sheep, beginning at 10/- per 100 sheep, and to increase by an additional 2/6 per 100 each year, to be supplemented by a fine of 50 per cent. for each failure to take out such licence. To provide also for the confiscation of ten per cent. of any such sheep removed from quarantine. Such quarantine to continue whilst visible scab exists. The owner could remove them for sale by twice dipping under Inspector's supervision. This is not too drastic, after years of playing with the question Farms and stock can be, and should be cleaned when grazing is good and sheep fat, and not left till winter. On these immense farms which carry but few stock, it should be quite possible to run such stock on half only, when the herbage is at its best. for purposes of cleansing, and so attain that desideratum, clean ground to move them on to after cleansing. The question of insufficiency of water having been raised is peculiar, as where there is enough for sheep to drink there must also be sufficient to dip them in.

We are asked by manufacturers to grow wool, not a mixture of scab, dip and wool, nor even a mixture of dip and wool. We have done so, or some of us have, and no better wool goes out of the country. But careful observers note many signs of the tendency to load the willing horse; to punish indirectly (but severely) the man who keeps the law, thereby to conciliate the habitual breaker of the law. A dangerous principle. It is impossible to fix any date for a simultaneous dipping to ensure all sheep being dipped in short wool, and quite apart from this, the opposition of a large section who grow undipped wool (men who have kept the law), to any such simultaneous dipping in the future, will amount to more than mere protest against such utter rot, although there are others still mad enough to imagine that dipping clean sheep in Kaffraria will cleanse the scabby flocks of men hundreds of miles away, who, or some of them, on a previous occasion refused to dip Simultaneous dipping can only stand a fair chance of success in the event of every owner being anxious and willing to exercise the utmost vigilance thereafter for eighteen months at least.—Yours, &c.,

A. WARREN.

Toise River,
District Cathcart.

Mr. W. R. Southey's Scheme.

Scab Again.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—As a sheep farmer and one who takes great interest in everything pertaining to farming, needless to say the subject requires no apology when asking for space. The question is not, can scab be cured or eradicated, the question is, how to compel those who will not cure their sheep or goats, and prevent them from infecting those who do, as well as causing injury to the Colony generally, and to do it effectually with as small an expenditure as possible and without being too severe on owners of infected animals.

If the farmer had nothing more difficult to contend with than the killing of the scab insect he would have no hardship to complain of. I will now try to draw an outline of what I consider would be a workable act, considerably reducing expenditure, more effectual and practical. Lime and Sulphur has been proved to be not only a certain cure for all kinds of scab but perfectly safe and easy of manipulation, as well as cheap, and only sulphur need be imported. I therefore suggest that dipping with Lime and Sulphur be made compulsory, Government placing it within the reach of every farmer for a period of three years, this being a sufficient time to eradicate scab from the Colony. It would then be the duty of Government to take the necessary steps to avoid infection from outside. To avoid a large amount of expenditure I would make every farmer more or less his own inspector. To do this the owner of every sheep or goat should be compelled to report within a given time, any outbreak of Scab, failing this he should be made liable to a fine of not less than £15 for a first offence, the fine to be increased for every additional offence.

Further, all infected farms to be placed under quarantine, such farm and address of the owner to be published together with a notice to the effect that no sheep, goats, wool or skins shall be allowed to be removed while such farm is under quarantine, any one buying sheep, goats, wool or skins and removing same from such farm while under quarantine shall be liable to a fine together with the owner of such farm of not less than £25 for a first offence, the fine to be doubled for every additional offence.

Further, I would suggest in place of a large staff, such as Chief Inspector of Scab and Scab Inspectors under him, the Police Force should be utilised. If necessary their number should be increased with a small increase of pay, every policeman from the Head of Police downwards should be instructed and made practical scab inspectors as well as taught the manipulation of the dip and the most effective mode of dipping. It should then be the duty of the police when on their periodical rounds, the periods being at short intervals, to inspect all flocks on the farms in their Wards and if necessary the unwilling farmer must be made to assist for the purpose of inspection. Needless to say in carrying out these measures there need be no unnecessary hardship, annoyance, or loss to the farmer.

The police, being under strict control of their officers and being a disciplined force, can be made, not only to do their duty but to assist the farmer in the curing of his flocks. Any complaint can be brought to the notice of the police officer in charge of a District, such complaint is easy of investigation and can be rectified, in serious cases punishment can be inflicted. My object in placing this matter before the public is to invite discussion, hoping it may ultimately lead to a cheaper and more practical method of eradicating Scab. —Yours, &c.

W. R. SOUTHEY.

Schoombie, March 20.

Lime and Sulphur Dip.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—As such a lot has been written on the above subject, I wish to convey to your many readers my experience on the effects of the above dip. Mr. Southey is perfectly correct, and so is Mr. W. Roe, of Graaff-Reinet. About fifteen years ago I started dipping with lime and sulphur, and for the last ten years I seldom or never have to dip any of my stock, my place being nearly fenced all round, and, consequently, never have a scabby sheep or goat on the place unless driven there from other parts during droughts. The great secret of the dip is not only in the preparation thereof, but also in the handling. After several experiments, I have found out that you can use lime and sulphur dip for any length of wool without damaging the wool. It is, of course best to dip while the wool is short, but sometimes you are compelled to dip long woolled sheep. In any case, the receipt is as follows:—

Take a 24 gallon soap pot and put in about six gallons of thoroughly clean water, and start the fire. As soon as the water boils, add 18 or 20 lbs. good *clean* sifted lime (fresh lime); boil for a few minutes till the bubbles come up, then add your sulphur by degrees until you have 100 lbs., a full cask, in the pot, and always keep stirring up the ingredients. See that the sulphur is made properly fine, breaking up all the lumps before adding it to the lime in the pot, then boil until the contents become of a greenish colour; remove from the fire and put the lid on the pot. This quantity is then ready for dip, and can be mixed with the cold water in the bath. The above quantity is sufficient dip for a bath of 400 gallons, which gives a thorough good strong dipping: thus, 18 lbs. of lime is quite sufficient to dissolve 100 lbs. of sulphur. It is the effects of the lime that dries out the wool, and it is the sulphur that gives you the dip. The principal thing is to handle everything perfectly clean, especially the water in the bath before mixing your dip, and to keep the drainage kraals as clean as possible, and you may be sure that one good dipping with lime and sulphur will prove a success. There is, no doubt, that it is the very best dip known to cure scab, and next to it comes Cooper's Dip, which is not only used for dipping, but for various other remedies. In conclusion, I wish to say that I have often added a few packets of Cooper's Dip to the lime and sulphur as an experiment, and found it very good. I have also tried to dissolve the sulphur with other dips, such as McDougall's or Little's chemical fluid, etc., but do not approve of it. The dip can be used cold, but it is better while the chill is taken off the water by adding the hot dip to the cold water in the bath.—Yours, etc ,

B. J. BURGERS.

[illegible], April 10.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We owe Mr. W. R. Southey thanks for starting the subject of Lime and Sulphur Dip in the *Agricultural Journal*. The more facts we can get on the subject the better, and so I will venture to give some of my experiences.

I am convinced that sulphur and lime is the best dip for curing scab and preventing re-infection. Besides the bogie, as Mr. Roe rightly calls it, of injury to the wool, there are two small faults, that good lime is not always readily procurable, and that, as often happens in rainy parts, if your dipping is put off or broken off for a day or two owing to bad weather or other cause, your boiled lime and sulphur solution undergoes a chemical change which quickly decomposes and unfits it for use.

I have used most of the fifty imported dips and especially the arsenical ones—Cooper's, Hayward's Paste, and Little's. They are all very good to cure scab and most necessary for killing tick. But you have to mix most carefully. Do you make them too strong they kill the sheep; do you make them too weak they fail to kill the scab. Cooper's, unless very constantly stirred, settles, which I think proves that it is not a perfect solution and is liable to be carried away in the fleece of the first sheep dipped and so upset the best mixture. Cold water mixtures take longer to saturate the fleece and penetrate to the skin; your sheep have therefore to be kept longer in the tank.

Should a cold rain fall on your sheep newly dipped in an arsenical dip, you have more or less deaths immediately or gradually from inflammation and its internal lesions, besides numbers that are only injured for life.—Yours, etc.

HENRY VEALE.

Koude River, Caledon, 8th April, 1905.

Still Lime and Sulphur.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read the letters in the *Agricultura Journal* on Lime and Sulphur also "Lime and Sulphur *vs.* Imported Dips," to which, I suppose, I am expected to reply, but I fail to see any particular point to which I need reply. I will say, however, I have only one object in view, that is, the eradication of scab from South Africa, which will bring in its train not only prosperity to the farmer, but the Colony generally. To accomplish this the sheep farmer must not only nail "lime and and sulphur" to his mast, but stand by it.

What brought prosperity to the Australian sheep farmer? The eradication of scab. What did it? *Lime and Sulphur.*

In an article by "First Combing" in the *Agricutural Advertiser* for January, 1905, No. 61, vol. 12, as to how scab was expunged, I quote:—"It was effected almost entirely by lime and sulphur. In a few cases of small flocks where the sheep could be easily collected, some proprietary dips were used, namely, Cooper's and, in less number, Little's, but lime and sulphur must be accepted as the actual and practically the only means of cure."

I am asked to stop my campaign against imported dips, and in place thereof to urge care and thoroughness in the use of all imported dips. Surely this is the duty of the vendors, and if it has not already been done, it is late in the day to start it now when lime and sulphur has proved such a success.

As to the rejection of lime and sulphur by the farmers of Somerset East. I am sorry for the farmers. Their objection, I have no doubt, is partly due to the imported dip men constantly pointing out the bad effect it has on wool. But the farmers should take into consideration that there is an object in this constantly harping on the bad effects on wool, the only objection the imported dip man can grasp at—to keep his own dip on the market and find sale. I will say to the farmers, try lime and sulphur; give it a fair trial, and you will use no other, except for ticks and lice.

I have not singled out any one imported dip. I have found from experience that lime and sulphur is the best and surest cure for scab, and my duty is to give my experience and place it before the farmers.

Mr. Timson says lime and sulphur will not kill ticks. I did not say it would; neither will Cooper's, taking it for granted the experiments just tried by C. J. V. at Coega to be correct.

The number of letters I am constantly receiving from farmers from all parts of the Colony, as well as the Transvaal and Orange Colony, asking for full particulars for the mixing, boiling, and use of lime and sulphur dip to cure scab, with the general complaint that other dips have failed, convinces more than ever that I am on the right track with lime and sulphur.

In conclusion, Mr Editor, allow me to thank you for the amount of space you are giving to this important subject in your constantly improving and interesting *Journal*. —Yours &c.,

W. R. SOUTHEY.

Schoombie, April 11.

Cold Storage of Fruit.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I recently made an investigation into the matter of certain fruit which had deteriorated during cold storage, such deterioration being clearly proved to be the result of inherent weakness in the fruit itself, and also defects in the method of handling and packing.

Much information was supplied me in the matter by Mr. Bell, of the Early Morning Market, and by Mr. Percy Jessop, of Wale Street, both of whom have made a lifelong study of the question. Mr. Jessop also lent me an interesting report written by Mr. G. Bradshaw, which appeared in the *Agricultural Gazette* of New South Wales in February, 1904.

It occurred to me that a summary of the information so derived would be of use to fruit growers and others in this country, and with your permission I will detail as briefly as possible the information which I gathered from all sources.

To ensure success:

Fruit should not be picked from trees growing in low-lying ground where water is extra abundant and foliage super-luxuriant or from trees growing on young land not yet freed from sourness.

Fruit grown on higher land where water supply is just sufficient and air not excessively humid is the best for cold storage.

Fruit should have reached its full size, which should not be less than the standard size, as stunted specimens are worse than useless.

Fruit should be picked slightly green.

Fruit should be selected not only for its choice flavour, but more especially for its known hardihood in cold storage, as some choice fruits have been proved by experience to be useless for such purposes.

Fruit should be rejected if slightly bruised, pricked or scratched, or if indicating any defect, external or internal.

Fruit shewing insect workings should specially be discarded.

Every ripe fruit with slight defect decomposes almost immediately in cold storage, and the whole box becomes mouldy and spoiled.

A bruised green fruit is not so dangerous, but should be discarded.

Fruit should be picked in the orchard in the morning after the dew has evaporated, and be kept in a cool place until transferred to special railway fruit cars, if practicable, kept cool with ice:

N.B.—Mr. Bell complains that he very frequently receives fruit which has been forwarded in an ordinary Cape Government railway truck, covered by a tarpaulin sheet, under which great heat is generated with the result that on arrival the fruit is found to be literally cooked and ruined. Experts are also of opinion that delays on the railway, owing to shunting operations, &c., are responsible for much of the damage complained of.

If at all possible, the fruit should be deposited in Cold Storage Chambers the same day as picked.

N.B.—A large American shipment was spoiled through the fruit being allowed to remain in the orchard over Sunday after packing, and in warm weather.

Well-ventilated boxes should be provided with proper inside packing, and it should not be possible for the fruit to shift about in its packing, nor to touch the wood of the box.

If practicable, separate cardboard compartments should be provided for each fruit.

Temperate climate fruits generally require colder temperature than tropical fruits.

The riper the fruit the colder the temperature required.

When green fruit is removed from Cold Storage Chambers it must be allowed to ripen slowly in a subdued light, and not in a sunny shop window, as in the latter the ripening is so rapid that early rot sets in. If at all practicable, fruit should not be removed direct from cool chamber to warm outside air, but placed for a time in an apartment where air of a moderate temperature can have free play round the cases.

Table of Temperatures Adapted for Cold Storage of Fruits,

being the average of the temperature recommended by reliable scientists and experts after careful experiments.

Plums	32°	N.B.—Fruit which has been stored at freezing point requires very patient treatment in bringing it back slowly to the normal temperature, so that for practical purposes 33° would be more advisable.
Apples	33°	
Pears	35°	
Melons	35°	
Oranges	35°	
Grapes	35°	
Tomatoes	37°	
Strawberries	37°	(Not for longer storage than two months).
Bananas	38°	
Lemons	39°	
Peaches	42°	

Mr. Valder, the representative of the New South Wales Government (who formerly superintended the experiments carried out by his Government with regard to the storage of fruit), advises that where a mixture of fruits is placed in the same chamber, the chamber should be kept at 37°, which, it will be observed, practically corresponds with the average of the temperatures as given in the foregoing table.

Although varying temperatures are recommended in the aforesaid table, it is interesting to note that plums, grapes and peaches from California to Sydney were all carried in the same temperature *en route*. It is probable, that if the tonnage of the different shipments had merited the separation of sorts, different temperatures would have been arranged had accommodation been available.

As regards fruit shipped from Cape Town, it would appear to be advisable that all fruits intended for early shipment should be subjected to the same temperature at the Docks Cool Chamber, unless the steamers could differentiate as per preceding paragraph.

Fruits intended for long storage on shore should, if possible, be kept in different chambers at the required temperatures To make this scheme more easy of adoption, some small chambers should be available for smaller consignments, so that a grower or dealer could rent such chamber, knowing that it would be strictly reserved for his purposes.

It is very certain that in this country the usefulness of Cold Storage is insufficiently recognised, for outside of the large Cold Storage Companies—whose premises are more especially used for the development of their own particular business, very little use is made of the facilities offered by Cold Storage, with the result that many thousands of pounds worth of so-called "perishables" are wasted every year, and the general community rendered the poorer thereby.

Professor J. W. Robertson, in writing on this subject, states

"Cold storage has no creative power, it does not create wealth, it preserves it and prevents it from becoming loss. It has no regenerative magic; it cannot bring back to a good condition that which is already spoiled, but it can keep what is put into it in a practically unchanged condition for a long period of time. It has three chief uses in commerce, to preserve commodities and thus avoid direct loss, to prolong the marketing season or seasons of consumption, and to enable the trader to choose his own time for buying and selling."

Amongst some of the uses to which Cold Storage Chambers are put in other countries, I may mention:—

Grain, fruit and nuts which are subject to the action of weevils are put into Cold Storage for a few days to kill the weevils or prevent same.

Ladies' furs, etc., are cold stored in summer to kill or prevent moth. One great American dry goods house has a cool chamber of 60,000 cubic feet which sometimes contains £400,000 worth of stored fur garments.

Other articles sent for preservation are ale and beer (in casks and bottles) cider, wines, vegetables of all sorts, flour and oatmeal, maize, wheat, flour, cheese, fruit, nuts, cigars, tobacco, meat, hams, lard, sausages, hops, honey, oysters, sardines, woollens, etc.

Seeing the enormous trade which other countries carry on in fruit export alone, and seeing the great possibilities for this country in the same direction, it is a matter of regret to note that during the height of the season of 1904, the largest weekly shipment of fruit from Cape Town from all sources was 83 tons, whilst during the present season 71 tons has been the greatest.

This would appear to indicate, as far as the farmer and fruit grower are concerned, either that they have not sufficiently recognised the possibilities of cold storage, or that their want of care in selecting and handling their produce prior to cold storing has only resulted in financial failure and disappointment.

As far as the general public is concerned, want of knowledge and lack of energy are both indicated.

Trusting that this humble effort may be the means of giving useful information to those fruit growers who have failed through want of knowledge, to those who are trying to succeed, and to those who have never tried at all, and that it may reveal to others the great possibilities offered by cold storage for the general welfare of the Colony and its inhabitants.—Yours, &c.,

HERBERT PENNY.

Cape Town March 27.

Destruction of Lynx (Red Cat).

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Lately I have been troubled very much with the Lynx or the commonly called Red Cat catching sheep, or even killing rams. Could anyone advise me the best method of killing them, as they do not pick up poison that has been handled. What month do they have their cubs?—Yours, &c.,

I. E. WRIGHT.

Karreekloof, April 10.

Lifting Water for Irrigation.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the March issue of your journal (p. 437) I see an inquiry about "Lifting water for Irrigation." At present I have a scheme, undertaken by Messrs. Rickie & Co. of Durban, who have guaranteed to erect a hydraulic ram to deliver me 15,000 gallons per diem to a height of 400 feet from the ram, the driving fall being from 30 to 40 feet, the drive pipe being 5 in. and the delivery 3 in. The distance from ram to reservoir is 3,000 feet. From the main reservoir the water is to be taken by gravitation. I know of one of these rams pumping to a height of 603 feet. I am surprised at your correspondent complaining of the frequent floods of the river being detrimental to the working of a ram, as either a gate, or an overflow-drain would put an end to this trouble.

Should your correspondent require any further information, I shall be only too pleased to give him all in my power on completion of the works here, which I hope will be early in May.—Yours, etc.,

G. W. YOUNG.

Wanstead March 16

RURAL REPORTS.

For the month ending 15th April, 1905.

Aberdeen.—Only light rains have fallen here during the month. Veld is, however, in fair condition. Weather promising. Live-stock of all descriptions are improving in condition. Ostriches are doing well.

Bedford.—The rainfall here has been exceptionally light except on a few farms, where very heavy storms have occurred. The rain that fell has run off without improving the grass much. Good soaking rains are still needed. Veld is in very bad condition and the winter outlook becoming serious. Lucerne fields are suffering through lack of water. Cattle generally are in very low condition and fast dying on many farms. A good many have been removed to the Orange River Colony and Bechuanaland for pasturage. Sheep are still doing fairly well, considering the drought. Ostriches are doing very badly. Very few chicks came out last season, and old birds are in poor condition.

Hay.—The average rainfall in this district has been light. Weather still promising for rain. Veld is in good condition but young and weak. Wheat crop is coming on nicely since the rains began to fall. Slaughter cattle are still very scarce. Horses, mules, etc,, in good condition and breeding well. Values high and markets firm. Small stock mostly doing well.

Murraysburg.—Weather here promises rain, but very little has, so far, fallen. Veld is in a very bad condition. Lucerne growing well. Cattle are in fair condition, slaughter animals scarce. Horses, etc., doing well. Values fair. Sheep are in very good condition and practically free from scab. Goats are not doing quite as well. Ostriches in good condition. Pigs thriving.

Oudtshoorn.—Very fair rains, in some places heavy ones, have fallen throughout this district, and weather is very promising. Veld is in fair condition, and the rains that are falling are expected to put it in splendid condition for the winter. Tobacco crop has been good and light. Lucerne doing very well. Livestock of all descriptions are in good condition and doing well. There is a little scab amongst sheep, but this is being eradicated. Ostrich breeding has been a failure this season. Pluckings are not promising owing to wet weather and dew.

Queenstown.—Veld here is in worse condition than it has been for a long time and the outlook for the winter is distinctly gloomy. Weather very changeable. Prevailing winds from the South West. Rainfall for March very light and a long way below the average. Cattle are in poor condition and no slaughter animals are to be had. Horses are also in poor condition. Sheep, including slaughter animals are in good condition in spite of the drought.

Riversdale.—Hot dry weather still prevails in the district. Veld is in variable condition, bad in some parts, good in others. Very little rain has fallen yet. Oats appear to be best crop. Lucerne is also doing fairly well. There is a good variety of fruit including pears, apples, peaches, plums, oranges. Orange trees are slightly troubled with scale in some parts. Livestock of all descriptions are in very fair condition. Horses have gone down in price owing to scarcity of money.

Somerset East.—There is little to add to my report for March. The little rain that has fallen has been partial and far below the average. All livestock are in very poor condition and it is anticipated that there will be heavy losses during the winter.

Steytlerville.—Since my last report the outlook for the coming winter has brightened. During the three days, 21st, 22nd, and 23rd March, 1·25 inches of rain fell, and during the three days, 9th, 10th and 11th April, just short of an inch came down. These rains were general throughout the District. On agricultural lines rain means everything to the farmer in these parts; and as there are no diseases amongst crops or stock the outlook is very encouraging.

TRANSKEI.

For the month ending 31st March, 1905.

Fizana.—A good deal of rain fell during the month just when the crops were yielding. This is looked upon as unfavourable to a good harvest, there being very few days of hot sunlight weather. Stock of all sorts is in good condition and no diseases were reported during the month.

Cofimvaba.– The rains have continued during the month, alternating with fine warm days, in fact, what may be called "fine growing weather" has prevailed, and the crops of cereals have been much benefitted. Grazing is abundant, and stock is in excellent condition. A few cases of redwater in cattle have been reported, and the usual steps taken to prevent its spread, otherwise all stock is free from disease.

Flagstaff.—The past month has been very wet, we have had 4·74 inches of rain. The grain crops in the district are very promising, and a fair harvest is anticipated. Stock are in good condition and free from disease, and the pasturage is all that can be desired

Idutywa.—During the past month there have been good rains, and the crops have come on well, but they will not be fit to reap before the frost comes. Pasturage is good, and all stock in good order. One case of Lungsickness among cattle has been reported, and the herd put under quarantine.

Kentani.—The prospects of a good harvest are not very encouraging. Cloudy or misty days were very prevalent during the month which have tended to retard the growth of the crops. A good heavy down-pour, followed by hot sunny days, would improve the crops considerably. The yield will be under the average, but should be sufficient for all the requirements of the people, provided they do not, as they generally do, sell too freely when the crops are harvested. Pasturage is good.

Libode.– During the last month there has been an abundant rainfall, and the crops are doing well, and, though late, should the frost keep off, the harvest will be a fair one. Horsesickness has been very rife, and a very great number of horses have died from it. All other stock are in very good condition.

Nqamakwe.—A fair amount of rain fell during last month, and the veld is luxuriant and green. Stock are in good condition. I fear the mealie crops are too backward for any harvest worth speaking of to be obtained. There are no locusts in the district.

Matatiele.—The past month was most favourable for the growing of grain crops. A rainfall of 2½ inches, distributed over about 14 days, was registered, and fortunately the frosts have kept off. Warmer weather having again set in, the prospects of a fair season are brighter than they were a few weeks ago. A few cases of Redwater were reported and dealt with, otherwise all stock are in excellent condition.

Mount Ayliff.—We are having warm, damp weather at present. Good soaking rains continue to fall, and one or two very heavy winds and thunderstorms have been experienced. Veld is in very good condition indeed. The Mealie and Kaffir-corn crops are looking healthy, but are rather backward, and it is feared that early frosts may prove disastrous. Cattle are in good condition. During the drought a large number of cows slipped their calves. Lungsickness continues to smoulder in one area. Horses are doing well, and fetching high prices. Sheep looking remarkably we.l, and goats are picking up since the rains began to fall.

Mount Currie.—Weather changeable. Rainfall slightly above the average. Veld in good condition. Wheat and oats are yielding fairly good crops. Mealies and Kaffir-corn are also looking well, and should give good crops, unless early frosts set in. Livestock of all description are in very good condition.

Mount Frere.—Plentiful and good, though not torrential, rains have fallen during the month. In the highlands there were complaints that the crops were being damaged. The crops are on the whole fair, but not so good as was anticipated. Stock of all description is doing well, and is in good condition. There were two outbreaks of lungsickness reported. One on examination by the Veterinary Surgeon was pronounced doubtful. The usual precautions were taken to prevent the spread of the disease. There was an outbreak of glanders in the local hotel stables. Fortunately, the Veterinary Surgeon happened to be here, and dealt with the matter, full reports of which were forwarded to the Agricultural Department. Mange in horses is not so prevalent just now, but is not yet eradicated.

Port St. John's.—There have been a few wet days here, but no great fall of rain. A good many locusts have been destroyed by spraying. Mealie crops promise well, though the continuous rains of last month did more harm than good. Horse-sickness is very prevalent just now; large numbers have died, and are still dying, but no accurate figures are obtainable.

Tabankulu.—The last month has been dull and wet, thus preventing the ripening of the crops. Now, however, it is warmer, and I trust that the yield of mealies will come up to anticipation. Redwater is dying out, and the pasturage is in excellent order.

Tsolo.—Good rains continued to fall last month. Provided the frosts come on late the harvest should be a fair one. The pasturage is in splendid order, and all stock in good condition. No fresh cases of lungsickness have been reported.

Umtata.—There is little to report for the past month from an agricultural point of view. The mealie crops which survived the drought are looking well. Horse-sickness has broken out in the neighbouring districts bordering on the coast, and is now within a few miles of our border. A heavy loss of horses is reported, the country in some locations being almost denuded of this animal. A few isolated cases are reported in this district. There appears to be no cure for this disease, though some owners have found a strong dose of brandy neat to be effective. In view of the very heavy mortality attending these epidemics which appear every few years in this country, it is regretted that our scientific men can render no aid. This year the attack is of a most virulent type. The local post-contractor for Port St. John's has lost twenty-three mules in the last three weeks.

Willowvale.—Good rains have fallen during the month, and pasturage is in good condition. Few of the mealie lands give promise of a fair yield. Vast swarms of young locusts have appeared along the coast. Livestock are in good condition. Prices remain unchanged and markets firm. Three outbreaks of Quarter Evil were reported during the month.

Xalanga.—There has been a refreshing rainfall during the months of February and March, which has greatly relieved the anxiety which was felt about grazing in the winter. There have been a few outbreaks of redwater, with several fatal cases. No other diseases amongst cattle have been reported. The crops of mealies and Kaffir corn are so backward that there is little hope of their escaping the frost. Mealie crops in the valleys in the Southern part of the district, which were well forward and pretty safe from frost, were levelled and quite destroyed by a most severe hail-storm on 1st April. This misfortune has destroyed the prospect, which was so hopeful, of a fair harvest in that part. I am informed that this hail-storm was very fatal to poultry and small stock.

NOTES ON THE WEATHER OF MARCH, 1905.

By Charles M. Stewart, B.Sc., Secretary to the Meteorological Commission.

A rainfall less than two-thirds of the average, thunderstorms of almost daily occurrence but frequently very localised, moderately cloudy weather with frequent fogs, temperature above the normal in the West, but below the average in the East and Interior, and a pressure higher than usual were the principal features of the weather of March, 1905.

Precipitation.—The mean rainfall for March, based on the data supplied from 339 stations, amounted to only 1·75 ins., falling on 7 days, being 0·64 in., or 35 per cent. less than the normal, a deficit which has neutralised to a considerable extent the beneficial effects of the excess rainfall of the previous month. An examination of the accompanying table shows that, except in the South-West and along the West Coast, precipitation was below the average, the deficit being greatest over the East Central Karoo, where it amounted to *minus* 55 per cent., and least over the Northern Border, where it was only ½ per cent. less than ordinary. The best watered portions were Kaffraria, Basutoland, the Orange River Colony, and Rhodesia. The rains, which were mostly of a light nature, more suitable for agricultural operations than for storage purposes, fell chiefly at the beginning of the month (1st to 3rd), about the 20th and 21st, and towards the end of the month. An analysis of the totals for the month shows that out of the 339 stations, only 2 reported nil, while 116 had 1 inch or less; 105 had between 1 and 2 ins.; 60 from 2-3 ins.; 37 from 3-4 ins.; 13 from 4-5 ins.; 5 from 5-6 ins.; and only one over 6 ins., namely, Bazeya, in the North-East, with 8·93 ins., the next highest being 5·88 ins. at Evelyn Valley, the other 4 stations with more than 5 inches being Insekeni (5·83 ins.), Katberg (5·45 ins.), Millwood (5·39 ins.) Matopo (5·27 ins.). The light nature of the rainfall is well borne out by the following

Division.	Mean Rainfall (1905).	Mean No of Days.	Average Rainfall. (1894-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
	Inches.		Inches.		Inches.	Percentage
Cape Peninsula	1·19	6	1·63	5	− 0·44	− 27
South-West	1·11	5	1·03	3	+ 0·08	+ 8
West Coast	0·47	3	0·46	2	,, 0·01	,, 2
South Coast	1·73	7	2·32	8	− 0·59	− 25
Southern Karroo	0·98	3	1·23	4	,, 0·25	,, 20
West Central Karroo	0·97	4	1·33	4	,, 0·36	,, 27
East Central Karroo	0·87	5	1·94	6	,, 1·07	,, 55
Northern Karroo	1·35	5	2·03	5	,, 0·68	,, 33
Northern Border	2·19	7	2·20	5	,, 0·01	,, 0·5
South-East	1·99	8	3·30	9	,, 1·31	,, 40
North-East	1·88	7	3·11	9	,, 1·23	,, 40
Kaffraria	3·38	12	3·69	10	,, 0·31	,, 8
Basutoland	4·13	12	..	..	..	..
Orange River Colony	4·28	12	..	..	..	..
Durban (Natal)	4·07	12	4·69	..	− 0·89	− 18
Bechuanaland	2·79	8	3·67	8	,, 0·88	,, 24
Rhodesia	3·90	8	..	..	..	..

summary of the maximum rainfall in 24 hours. The maximum daily fall amounted to inch or less at 280 stations out of 336 furnishing particulars, while 51 had maxima between 1 and 2 inches, only 5 having a maximum daily precipitation of over 2 inches. The largest quantity collected in one day was 3·78 ins. on the 4th at Matopo during a thunderstorm; Bazeya coming next with 3·00 ins. on the 1st, then Fort Rixon with 2·35 ins. on the 4th, Millwood with 2·04 ins. on the 2nd, and Halseton with 2·02 ins. on the 22nd.

Although *Thunderstorms* were reported as occurring on every day of the month except the 5th and 6th, these were mostly very local in distribution, only 346 cases being reported during the month; these were most general on the 20th and 21st, and fairly widely distributed on the 1st, 13th and 28th. A native and horse were killed by lightning on the 14th at Main, while the gaol at Hopetown was struck by lightning at 11 p.m. on the 25th. *Hail* was reported from 11 stations on eight days, but apparently no serious damage was done. No *snow* or *sleet* was reported.

Temperature, Cloud and Wind.—The monthly temperature on the mean of all the stations was 67·4°, being 0·2° warmer than March, 1904, and only 1·8° cooler than February last. The mean of the maximum temperatures was 77·9°, and of the minimum temperatures 56·9°, thus shewing a mean daily range of 21°, or about the same as in the previous month. The mean temperature was from 1½ to 2 degrees warmer than the average over the South-West and along the Coast to Mossel Bay, but was cooler than usual further East by amounts varying between ½ and 2½ degrees; inland it was about a degree colder than the averages. The mean warmest station was Kenhardt with a temperature of 74·6°, while the mean coldest station was Kilrush, in Kaffraria, with 57·4°.

The highest mean maximum of 88° was recorded at Kenhardt and the lowest mean minimum of 48·9° at Hanover. The warmest days of the month were from 7th to 9th, 12th to 13th and 18th to 20th, while the coolest nights occurred mostly between the 6th and 10th, 15th and 17th, and the 23rd and 24th. The mean of the absolute maxima amounted to 93° and of the absolute minima to 49·1°, giving a mean monthly range of 43·9° or 1·9° more than in February. The absolute maximum of 101·5° was registered on the 19th at Dunbrody and the absolute minimum of 38·0° at Kilrush on the 16th and 17th, thus giving an extreme monthly range of 63·5° over all the stations.

Frost was reported as occurring only at one station, Table Hill, on the 8th.

Cloud.—The mean amount of sky obscured during the month was 43 per cent., 2 per cent. less than in February and the previous March. The distribution was fairly uniform, being mostly between 45 and 50 per cent along the coasts; in Kaffraria it increased inland to 60 per cent. at Main and Umtata, and decreased to the minimum of 19 per cent. at Kenhardt; it rose again to 55 per cent. at Hopefountain in Rhodesia.

Fog or Mist was reported on altogether 145 occasions on 29 days of the month, chiefly the 1st, 3rd, 4th, 9th and 26th.

The *Winds* were rather variable through ut the month, being, however, chiefly Easterly and South-Easterly, although at many stations the Southerly and North-Westerly winds were about equal. The mean force on the Beaufort Scale was 1·99 corresponding to a mean velocity of 12·95 miles per hour. *Gales* were reported from 9 stations on 8 days of the month a violent black South-Easter affecting the Cape Peninsula from the 1st to the 4th.

Hot winds were experienced on 3 days, and an *Earthquake* at Schuilhoek at 2 p.m. on the 17th.

OBSERVERS' NOTES—MARCH, 1905.

Groot Drakenstein.—Temperature 2·3° above average of six years. Rainfall 0·20 above average (1893-1902). South-Easters very severe, especially beginning of month.

Dunedin.—Although the springs in this vicinity have been somewhat strengthened by the February and March rains, and the country is nice and green, the greater part of the Nieuwveld is still very dry.

Bloemhof.—Drought far from broken; slight showers have yet little effect on veld.

Boschfontein.—Frequent heavy dews. Winds light and mainly N.W.; S.E. on 16th and 27th. Little or no water added to dams by rain, but every drop went into the ground, doing immense good in keeping veld on the grow. Several heavy thunderstorms in immediate neighbourhood.

VOSBURG.—Splendid soaking rain all round at end of month; dams still running out strongly.

WAVERLEY.—Drought still continues. Farmers trekking in all directions. What is to become of the country—as far as farming interests are concerned—one does not know.

PELLA.—Grass growing splendidly.

CARNARVON FARM.—This month has been remarkable for the number of *small* "rainy days"; out of the eleven eight are under ¼ inch. Five windy and one cloudless day.

THIBET PARK.—Worst drought ever experienced since the farms in the Queenstown District have been occupied. Rivers dry for miles at a stretch, then only a pool or two.

KOKSTAD.—Veld is green and good. Rivers still running strong. Crops in splendid condition. Frosts might destroy some of mealies.

SOMERVILLE.—Crops in the neighbourhood promise to be abundant. Beans have taken "rust" considerably.

FORT RIXON.—Part of mealie crop saved by late good rains and about half crop of Kaffir corn. Potatoes, Mangels and Lucerne planted last month coming on well. Cattle and small stock doing well.

MAIN.—A native and a horse killed by lightning on the 11th.

KOKSTAD.—(The Willows) Plentiful rains of February enabled farmers to plough and to sow winter and spring crops, the former doing well, the latter are in some instances already appearing. Prospects good unless we get early frosts. Mealie crop backward and showing signs of last year's drought. A few cases of enteric in town—two fatal cases; one case of diphtheria. Horses suffered from biliary fever; large percentage of deaths.

TEMPERATURE, MARCH, 1905.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Simon's Town	79·5	63·0	71·3	99·6	19	58·0	14 & 15
Devil's Peak	73·4	58·7	66·0	91·0	18 & 19	52·0	15
Cape Town (S.A.C.)	81·2	61·0	71·1	99·0	19	54·0	6
Sea Point	79·5	61·4	70·5	95·8	19	52·6	6
Groot Constantia	76·0	58·5	67·2	95·0	20	51·0	9
Wynberg	79·7	60·0	69·8	98·5	19	53·0	14
Blaauwberg	75·8	58·7	67·2	99·5	18	52·0	6
Groot Drakenstein	83·2	61·7	72·4	100·2	18	52·9	11
Elsenburg (Agri. College)	81·6	59·0	70·3	98·0	18	49·1	17
Wellington	83·3	63·7	73·5	97·5	19	52·5	15
Robertson (Govt. Plantation)	84·8	57·2	71·0	101·0	18	51·0	15
Ceres	81·5	50·5	66·0	95·0	8	46·0	3 & 16
O'okiep	83·2	58·0	70·6	97·0	7	49·3	1
Dunbrody	84·6	56·6	70·6	101·5	19	49·2	23
Cape L'Agulhas	72·7	62·3	67·5	89·0	19	57·0	12
Cape St. Francis	70·0	59·9	65·0	73·0	20	53·0	23 & 29
Mossel Bay	76·5	63·8	70·1	88·0	21	55·0	1
Heidelberg	79·8	58·0	68·9	100·0	19	50·0	11
George (Govt. Plantation)	73·9	57·2	65·6	94·8	19	48·5	17
Port Elizabeth	73·7	61·0	67·3	89·0	20	55·0	3
Storms River	77·1	57·4	67·3	96·0	25	50·0	24
Amalienstein	84·9	57·6	71·2	98·0	18, 19 & 25	48·0	17
Rust en Vrede	78·8	54·6	66·7	93·0	19	44·0	1
Murraysburg	79·6	52·5	66·1	91·0	8	45·0	16
Hanover	77·6	48·9	63·2	87·0	8 & 9	40·0	20
Wagenaar's Kraal	77·1	52·4	64·8	92·0	8	44·0	17
Kenhardt	88·0	61·3	74·6	101·0	7 & 8	53·0	15
Hope Town	83·8	57·1	70·5	93·2	9	46·0	10
Kimberley	86·0	56·3	71·1	95·0	9	48·9	11
Sydney's Hope	78·1	57·3	67·7	100·2	9	51·0	17
East London	71·6	60·4	66·0	79·0	13	51·0	21
Grahamstown	79·4	54·9	67·1	100·6	9	45·6	23
Stutterheim	73·5	54·7	64·1	96·0	9	46·5	24
Aliwal North	76·9	51·5	64·2	87·0	12	46·0	24
Rietfontein (Aliwal North)	73·8	49·8	61·8	83·4	12	43·9	24
Port St. John's	76·6	62·1	69·4	87·0	12	49·0	24
Matatiele	76·2	51·0	63·6	87·8	12	44·5	8
Kokstad	72·5	49·8	61·2	89·0	12	43·0	18, 19 & 20
Kilrush	65·0	49·9	57·4	80·0	12	38·0	16 & 17
Main	73·7	58·7	63·7	92·8	12 & 13	48·1	8
Umtata	74·7	57·2	66·0	92·0	12	53·0	20
Mohalies Hoek	73·8	50·8	62·3	85·0	13 & 14	42·0	24
Hope Fountain	76·5	56·4	66·4	88·6	12	48·6	26
Means	77·9	56·9	67·4	93·0	..	49·1	..
Extremes	..	..	..	101·5	19	38·0	16 & 17

RAINFALL, MARCH, 1905.

I. CAPE PENINSULA.

	INCHES
Royal Observatory, (*a*) 12 inch gauge	1·00
Cape Town, Fire Station	0·43
Do South African College	0·80
Do Sea Point (Hall)	0·48
Do do. (Attridge)	0·42
Do Molteno Reservoir	0·89
Do Platteklip	1·20
Do Signal Hill	0·34
Table Mountain, Disa Head	1·45
Do Kasteel's Poort	2·23
Do Waai Kopje	3·37
Do St. Michael's	3·34
Bishopscourt	1·21
Kenilworth	1·01
Wynberg (St. Mary's)	1·04
Groot Constantia	1·46
Tokai	1·52
Simon's Town (Wood)	1·02
Do. (Gaol)	1·90
Robben Island	0·39
Fish Hoek	0·73
Cape Point	0·24

I. SOUTH-WEST:

Eerste River	0·59
Klapmuts	1·21
Stellenbosch (Gaol)	1·03
Somerset West	1·23
Paarl	0·86
Wellington (Gaol)	1·38
Groot Drakenstein	1·30
Tulbagh	0·75
Ceres	1·75
Caledon	0·29
Worcester (Gaol)	0·35
Hex River	0·47
Lady Grey (Div. Robertson)	0·52
Robertson	0·46
Robertson (Govt. Plantation)	0·80
Montagu	1·00
De Hoop (Div. Robertson)	1·80
Porterville Road	2·07
Rawsonville	1·77
The Oaks	0·51
Danger Point	1·28
Vijgeboom's River	0·87
Elsenburg Agricultural College	1·19
Roskeen	1·35
Vruchtbaar	2·30

III. WEST COAST:

Klipfontein	0·43
O'okiep	0·38
Springbokfontein (Gaol)	0·55

III WEST COAST—*Continued*

	INCHES
Garies	0·06
Korsefontein	0·27
Dassen Island	0·33
Malmesbury	1·33
Piquetberg	0·82
Van Rhynsdorp	0·00
Clanwilliam (Gaol	0·43
Wupperthal	0·80

IV. SOUTH COAST:

Cape L'Agulhas	1·45
Bredasdorp	2·03
Swellendam	2·67
Heidelberg	0·51
Riversdale	1·59
Geelbek's Vlei	1·91
Mossel Bay	0·23
George	3·12
Ezelzagt	0·30
Millwood	5·39
Knysna	1·15
Plettenberg Bay	1·06
Blaauwkrantz	2·95
Witte Els Bosch	1·50
Cape St. Francis	1·26
Witteklip	2·64
Uitenhage	2·65
Dunbrody	1·13
Port Elizabeth (Harbour)	1·15
Tankatara	0·74
Shark's River (Nursery)	0·84
Do (Convict Station)	0·68
Karnmelk's River	1·68
Zuurbraak	2·48
Vogelvlei	0·52
Great Brak River	1·05
Armadale	3·22
Centlivres	1·31
Woodifield (George)	1·80
Potbery	1·28

V. SOUTHERN KARROO:

Ladismith	0·72
Amalienstein	1·03
Calitzdorp	0·50
Oudtshoorn	0·50
Uniondale	0·75
Kleinpoort	1·70
Glenconnor	1·35
Triangle	0·92
Rust en vrede	1·34

VI. WEST CENTRAL KARROO:

Prince Albert Road	0·17
Fraserburg Road	0·44

VI. W. C. KARROO—*Continued*

	INCHES
Prince Albert	0·59
Zwartberg Pass	3·03
Dunedin	1·27
Nel's Poort	0·74
Camfer's Kraal	0·66
Lower Nel's Poort	0·68
Baaken's Rug	0·29
Willowmore	0·94
Steytlerville	1·51
Krom River	0 71

VII. EAST CENTRAL KARROO:

Aberdeen (Gaol)	0·68
Aberdeen (Bedford)	0·86
Aberdeen Road	0·82
Rietfontein	1·53
Kendrew	1·76
Graaff-Reinet	0·60
New Bethesda	0 78
Roode Bloem	0·40
Patrysfontein	0·90
Toegedacht	0·48
Klipfontein	0·43
Cranemere	0·00
Pearston	0·10
Somerset East	1·88
Middleton	1·48
Corndale (Div. Aberdeen)	1·24
Cookhouse	1·54
Middelwater	0·60
Buffelskloof	3 41
Glen Harry	0·69
Bloemhof	0 78
Roode Hoogte	0·97
Walsingham	0·17
Arundale	0·29
Spitzkop (G.R.)	0·05

VIII. NORTHERN KARROO:

Sutherland	1·12
Fraserburg	1·17
Droogefontein	0·92
Carnarvon	1·10
Wagenaar's Kraal	1·97
Brakfontein	0·77
Victoria West	0 81
Britstown	1·37
Murraysburg	2 39
De Kruis	1·35
De Aar	2·38
Middlemount	0·81
Hanover	2·02
Philip's Town	4·16
Boschfontein	1 90
Petrusville	1·89
The Willows	0 47
Middelburg	1·22
Colesberg	1·49
Tafelberg Hall	0·79
Cradock	0·63
Witmoss	0·60
Steynsburg	1·16
Quagga's Kerk	0·61

VIII. N KARROO—*Continued*

	INCHES
Tarkastad	0 79
Riet Vlei	1 32
Omdraai's Vlei	2·69
Varken's Kop	1·08
Culmstock	1·13
Doorskuilen	0·82
Hillmoor	1·26
Glen Roy	0·44
Fish River	1·28
Loxton	0 89
Waverley	0·50
Scorpions Drift	0·50
Wildebeestkooij	2·03
Maraisburg	1·85
Montagu	2·04
Schuilhoek	1·47
Vosburg	1·63
Zwavelfontein	2·07

IX. NORTHERN BORDER.

Pella	1·49
Kenhardt	0·95
Van Wyk's Vlei	2·17
Prieska	2·34
Dunmurry	1 69
Griqua Town	2·41
Campbell	2·54
Douglas	2·43
Avoca (Herbert)	2·68
Hopetown	3·52
Newlands (Div Barkly West)	3·38
Kimberley (Gaol)	2 65
Do. (Stephens)	3·23
Barkly West	3·15
Upington	0·82
Trooilapspan	1·03
The Halt	0·62
New Year's Kraal	2·50
Karree Kloof	2·00

X. SOUTH-EAST:

Melrose	0·22
Fairholt	0·89
Cheviot Fells (Bedford)	0·76
Bedford (Gaol)	3 39
Sydney's Hope	0·81
Adelaide	2·22
Atherstone	1·10
Alexandria	0·45
Salem	0·21
Graham's Town (Gaol)	1·13
Do. (Bact. Inst.)	1·17
Heatherton Towers (near Graham's Town)	0·76
Fort Beaufort	1·57
Katberg	5·45
Balfour	3·95
Seymour	1·22
Glencairn	1·96
Alice	1·42
Port Alfred	0·49
Hogsback	3·42
Thaba N'doda	2·89
Peddie	0·74
Cathcart	2 14

X. SOUTH-EAST—*Continued*	INCHES
Keiskama Hoek	1·39
Thomas River	1·53
King William's Town	1·00
Do. Hospital	1·64
Do (Besté)	1·94
Dohne	2·38
Dontsah	2·61
Mount Coke	1·45
Blackwoods	2·93
Albertvale	1·82
Kubusie	1·80
Blaney	0·95
Kei Road	3·02
Evelyn Valley	5·88
Berlin	0·50
Isidenge	2·53
Perie Forest	2·98
Quacu Forest	1·75
Kologha	3·54
Fort Jackson	0·50
Komgha	2·91
Prospect Farm (Div Komgha)	2·62
East London, West	2·77
Do East	3·34
Fort Cunynghame	2·37
Bolo	1·38
Fort Fordyce	4·95
Daggaboer	0·41
Lynedoch	0·45
Sunnyside	1·05
Exwell Park	0·99
Forestbourne	3·98
Chiselhurst	0·79
Cata	3·36
Wolf Ridge	3·42

XI. NORTH-EAST:	
Venterstad	2·30
Ellesmere	1·70
Molteno Station	2·30
Cyphergat	1·60
Thibet Park	0·52
Sterkstroom	2·25
Do. (Station)	2·11
Rocklands	0·51
Aliwal North (Gaol)	3·08
Do. (Brown)	3·27
Rietfontein	2·62
Hex's Plantation	1·29
Carnarvon Farm	1·86
Jamestown	1·97
Queenstown (Gaol)	1·56
Tylden	2·08
Herschel	3·32
Lady Grey	3·61
Bolotwa, Contest	1·60
Lady Frere	0·99
Keilands	1·34
Barkly East	1·99
Lyndene	0·65
Mooifontein	0·91
Poplar Grove	0·62
Whittlesea	0·35

XI. NORTH-EAST—*Continued*	INCHES
Halseton	3·10
Nooitgedacht	1·02
Blikana	3·68
Table Hill	2·78
Hughenden	0·88
Glen Wallace	2·29
Indwe	3·07
Albert Junction	0·83

XII. KAFFRARIA:	
Slaate, Xalanga	2·20
Ida, Xalanga	3·52
Cofimvaba	2·99
Nqamakwe	1·64
Main	1·89
Engcobo	3·49
Butterworth	2·13
Kentani	3·28
Idutywa	2·43
Willowvale	3·63
Mount Fletcher	1·82
Elliotdale	1·59
Matatiele	2·55
Umtata	3·86
Kokstad	2·98
Umzimkulu	3·47
Tabankulu	3·15
Kilrush	4·33
Somerville (Div. Tsolo)	4·41
Tsomo	1·75
Bazeya	8·93
Cwebe	3·11
Soteba	2·46
Flagstaff	1·74
Insikeni	5·83
Mandileni	2·95
Cedarville	2·58
Kokstad (The Willows)	3·64

XIII. BASUTOLAND:	
Mafeteng	4·18
Mohalie's Hoek	1·92
Qacha's Nek	3·16
Maseru	4·26

XIV. ORANGE RIVER COLONY:	
Imperani	3·78
Zuikerkop	4·77

XV. NATAL:	
Durban, Observatory	4·07

XVII. BECHUANALAND:	
Vryburg	4·52
Mafeking	2·60
Taungs	2·72
Setlagoli	2·11
Zwartlaagte	2·00

XVIII. RHODESIA:	
Hope Fountain	3·35
Fort Rixon	4·95
Luscombe Farm	3·35
Matopo Park	5.27

DEPARTMENTAL NOTICES.

Tobacco Seed.

A small consignment of the undermentioned varieties of Tobacco Seed has been received from America, and is available for disposal, at the prices quoted:—

White Burley, and Blue Pryor 6d. per oz.

The seed will be distributed in lots not exceeding 3 oz. of each variety, and applications, accompanied by a remittance for the amount due, must be addressed to the Under Secretary for Agriculture. Cape Town. Applications will be dealt with in the order in which they are received.

Seeds for Distribution.

With further reference to the articles appearing in the August, September, and October numbers of the *Agricultural Journal* in connection with Seeds for experimental purposes, we have been requested to announce that supplementary supplies of the undermentioned varieties of Seeds have now come to hand, and are available for distribution in experimental quantities:—

Standard Red Wheat; White Clover; Giant White Clover; Alsyke Clover; Red Clover; Poa pratensis (Meadow Grass); Buckwheat; Winter Vetches; Spring Vetches; Italian Rye Grass; Perennial Rye Grass; Cocksfoot Grass; Timothy Grass; Winter Rape; Summer Rape; Early Red Trifolium; Giant Sainfoin (milled); Common Sainfoin (milled); Durum Wheat; Bobs Wheat (Australian).

Farmers desirous of making trials of any or all of these seeds, and who are willing to supply reports on the results of their experiments with the same, should apply direct to Dr. Eric A. Nobbs, Agricultural Assistant, Department of Agriculture, Cape Town.

With regard to reports on the results of the trials, it may be mentioned that, after the lapse of a reasonable time from the date of receipt of the seed, printed Report Forms will be sent to those concerned, which must be filled in, signed and posted to the address printed on the back of the Forms.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice in Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from a contagious or infectious disorder, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and, in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to the Chief Veterinary Surgeon, Cape Town (telegraphic address: "Veterinus," Cape Town), the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the treatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residences or nearest Railway or Post Cart Station.

D. Hutcheon,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 17th March, 1905.

Stations		*Names of Veterinary Surgeons.*
Beaufort West	..	S. Elley, M.R.C.V.S.
Cape Town	..	W. G. Pakeman, M.R.C.V.S.
,,	..	G. G. Henderson.
East London	..	R. W. Dixon, M.R.C.V.S.
Elsenberg	..	R. Paine, M.R.C.V.S.
Grahamstown	..	T. Bowhill, F.R.C.V.S.
Kokstad	..	W. A. Hutchence, M.R.C.V.S.
Molteno	..	J. F. L. Lyons, M.R.C.V S.
Mossel Bay	..	J. A. Robinson, M.R.C.V.S.
Somerset East	..	J. D. Borthwick, M.R.C.V.S.
,,	..	J. Sproull, M.R.C.V.S.
Umtata	..	P. X. Kearney, M.R.C.V.S.
Uitenhage	..	G. W. Freer, M.R.C.V.S.
Various	..	C. Goundry, M.R.C.V.S.
Vryburg	..	J. Neill, M.R C.V.S.
Worcester	..	A. Goodall, M.R.C.V.S.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal.*

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d.); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); †Dairy and its Products by D. Hutcheon (2d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); †Hessian Fly (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d.): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); *Gas Treatment for Scale Insects (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); Cyanide Gas Fumigation (1d.); The Fruit Moth (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.
† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d); *Fruit from Orchard to Buyer (1d); Netting for Fruit Trees (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and their treatment (1s); Horse Sickness (2d); *Heartwater (1d); *Liver Disease among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.), *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.), *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); †International Conference of Sheep Breeders (1d.); The Eye and its Diseases (1d.). Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d); Persian Sheep and Heartwater (1d); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d); Notes on the so-called Paralysis Tick (1d); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates.*

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.; Transvaal Plant Import Regulations (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

THE PRODUCE MARKET

CAPE TOWN.

Mr. R. Müller reports for the month ending April 20th, 1905:—

Wool.—The offerings during the month consisted mostly of Medium length and Lambs Wool, for which very fair prices were realised. The results of the closing rates of the last London Sales, have caused a quieter feeling in our market, but this, however, affects more particularly common qualities. Karroo lately offered may be quoted from 6d. to 7d.; Malmesbury and Piquetberg from 5d. to 6d. Some parcels of Malmesburys were burry and these realised from 4¾d. to 5¾d. according to conditions. Snow Whites of Extra super type are in good request. Some parcels offered may be quoted from 1s. 6d. to 1s. 8d. Generally speaking there is a healthy feeling in the market at Home.

	s.	d.	s.	d.
Super Long Grass Veld Wool	0	8	0	9
Super Long Karroo Veld Wool	0	6¾	0	7¾
Medium Karroo Veld Wool	0	5	0	6

	s.	d.	s.	d.
Short and Inferior ..	0	4	0	5
Wool for Washing ..	0	4½	0	6
Snow-white Super to Extra	1	5	1	8½
,, Ordinary	1	2	1	5
Fleece Washed ..	0	9	0	10

Mohair.—There is not very much offering at present and quotations are more or less nominal. For some parcels of Firsts 10½d. to 11d. has been paid, one lot of Mixed Kids was sold at 1s. 1d. Reports from Home show the market to be unchanged, with business doing particularly in Medium and Mixed Blues.

	s.	d.	s.	d.
Mohair, Firsts, Summer	0	10	0	11¾
,, Kids.. ..	1	3½	1	4
,, Seconds ..	0	6½	0	9¾

	s.	d.	s.	d.
Mohair Winter ..	0	10	0	10¾
,, ,, Kids..	1	0	1	2

Ostrich Feathers.—Mail news from the last London Sales confirm the advance cabled out, on all descriptions of White and Feminas, good Thirds of both sorts were in strong demand, Spadonas and Floss generally were higher, while Blacks and Drabs suffered a decline of about 10 to 15 per cent. Parcels of good average coming forward meet with a good demand.

	£	s.	d.	£	s.	d.
Super Primes	10	10	0	35	0	0
Firsts, Ordinary to Super ..	8	0	0	10	10	0
Seconds ..	6	0	0	7	0	0
Thirds ..	3	10	0	5	0	0
Femina (super)	7	0	0	10	0	0
Femina, Seconds to Firsts ..	4	0	0	6	0	0
Byocks (fancy) ..	5	0	0	7	10	0
Long Blacks ..	4	10	0	7	10	0
Medium Blacks	3	0	0	3	10	0
Short to Medium	0	10	0	2	10	0

	£	s.	d.		s.	d.
Floss ..	0	5	0		10	0
Long Drabs ..	2	10	0		10	0
Medium Drabs..	1	5	0		15	
Short to Medium	0	10	0		10	
Floss ..	0	2	6		10	
White Tails ..	1	5	0		15	
Coloured Tails..	0	5	0		10	
Chicks ..	0	1	0		2	
Spadonas ..	0	10	0		0	0
Inferior Black & Drabs, Short to Long ..	0	0	6	1	10	0

Skins and Hides.—There is no material change to report all classes are in good demand and meet with a ready sale.

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date April 20:—

Ostrich Feathers.—The market was well supplied this week with a good average assortment. Competition was both weak and irregular, but there was no quotable change in prices. The total quantity sold amounted to £7,190 6s. 3d., and weighed 3,027 lbs. 12 ozs. Among the large and valuable consignments offered by ourselves were some choice parcels from the well-known camps of Mr. A. A. Kingwill, of Colonies Plaats, Graaff-Reinet; Mr. W. R. Southey, of Varkens Kop, Schoombie; and Messrs. W. E. Murray & Sons, of Roodebloem, Graaff-Reinet. These are some of the feathers which took prizes at our recent Agricultural Show; they were much admired by the buyers, and excited keen competition. The following are some of the prices realized:—Primes: £51, £32, £31, £25 10s., £24, £23, £21, £20 1s., etc. Feminas: £17 2s. 6d., £15 5s., £14 12s. 6d., £14 10s., £14 2s. 6d., £14, etc. Fancies: £16, £9 15s., £9 7s. 6d., etc. Greys: £11 5s., £10 12s. 6d., etc. Blacks: £14, £11 12s. 6d., £9 17s. 6d., £9 10s.,

£8 17s. 6d., £8 12s. 6d., etc. Drabs: £5 17s. 6d, £5, £4 5s., etc. White Tails: £7 2s. 6d, £7, £6 17s. 6d., £5 15s., £4 17s. 6d., etc. Light Tails: £5 5s., £4, £3 15s., etc. B.B. Tails: £2 10s., £2 1s., £2, etc. The prices obtained for those tails are higher than have been known for many years.

	£	s.	d.	£	s.	d.
Primes: Extra super				Special Prices.		
Good to super	10	0	0	12	0	0
Whites: Firsts	6	10	0	9	0	0
Seconds ..	4	10	0	5	10	0
Thirds ..	2	10	0	4	10	0
Feminas: Tipped and Grey ..	5	0	0	7	10	0
Seconds ..	2	5	0	4	0	0
Thirds ..	1	7	6	2	5	0
Fancy ..	4	5	0	6	10	0
Tails: White ..	1	7	6	2	10	0
Light ..	1	0	0	1	10	0
Coloured & Dark	0	5	0	0	15	0

	£	s.	d.	£	s.	d.
Blacks: Long ..	3	5	0	5	0	0
Medium ..	1	7	6	2	12	6
Short ..	0	10	0	1	0	0
Wirey ..	0	1	0	0	1	6
Floss ..	0	6	0	1	1	0
Drabs: Long ..	1	12	6	3	0	0
Medium ..	0	15	0	1	7	6
Short ..	0	2	6	0	6	0
Wirey ..	0	0	6	0	1	0
Floss ..	0	6	0	1	4	0
Spadonas: Light	2	0	0	3	10	0
Dark ..	0	12	6	1	12	6
Chicks ..	0	0	3	0	1	6

Wool.—This market remains steady, and a fair amount of business has been done in the market during the week, at current prices, our sales of 600 bales being the most important.

Snowwhite Extra Superior ..	17½d	19d
Snowwhite Superior ..	16d	17d
Do Good to Superior	14½d	15½d
Do Inferior Faulty	13½d	14d
Grease, Super Long, well-conditioned, Grassveld grown, special clips	7d	8d
Grease, Super Long, well-conditioned, Grassveld grown ..	6¼d	7d
Grease, Super Long, well-conditioned Karoo Grown ..	6d	6½d
Grease, Super Long, well-conditioned, Mixed Veld ..	5¾d	6½d
Grease, Light, faultless, medium, Grassveld grown.. ..	6d	6¾d
Grease, Light, faultless, medium Karroo grown	5½d	6d

Grease, Light, faultless, short Karroo grown	5¼d	6d
Grease, Short, faulty and wasty ..	4½d	4¾d
Grease, Coarse and Coloured ..	4½d	4¾d
Scoured, Coarse and Coloured ..	6½d	10½d
Free State Grassveld Grease, long and well-conditioned ..	6d	6¼d
Free State medium grown, light, with little fault ..	5¼d	5½d
Free State short, faulty and wasty ..	4½d	5d
Free State Karroo grown, long and well-conditioned ..	5¼d	5¾d
Free State medium grown, light, with little fault ..	5d	5½d
Free State short, faulty and wasty ..	4½d	4¾d

Mohair.—There is nothing new to report in this market. A few lots of new seasons short-grown Firsts have changed hands at 11d., but there has been no business dne in Summer Kids. Up to the present, no really good Firsts have come in, for this class the demand is likely to be keen, but the hair will have to be well-grown. On the public market on Tuesday a large quantity was offered to fairly good competition at unchanged prices.

Kids, superfine ..	None offering.	
Kids, ordinary ..	1s 3d	1s 4d
Kids, seedy and mixed	0s 9½d	1s 0d
Superior Firsts ..	None offering.	
Ordinary Firsts ..	0s 10¾d	0s 11d
Long Blue O.R.C. Hair	None offering.	

Mixed Hair ..	0s 9½d	0s 10¾d
Seconds and Grey ..	0s 7d	0s 8½d
Thirds	0s 5¼d	0s 5¼d
Winter	None offering.	
Do. Kids ..	None offering.	

Skins.—Sheepskins sold in bundles at 6⅛d per lb.; Pelts at 4d; Capes, 1s 6d; damaged, 6d each; Angoras, 5d Shorn, 4½d; damaged, 2¾d; Goat, 10½d; damaged, 5½d per lb; Springbok, 8d each.

Hides.—Sun-dried Hides sold this week at 7¾d, and for damaged, 6d; Drysalted, 7d; damaged, 5¾d, and Thirds, 3½d.

THE

Agricultural Journal.

OF THE CAPE OF GOOD HOPE.

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All communications should be addressed:
"The Editor, Agricultural Journal, Department of Agriculture, Capetown."
Telegraphic Address: "Bulletin," Capetown.

CONTENTS.

PAGE

NOTES— 746—751

Useful Imperialism—"Izal" as a Tick Destroyer—Bonemeal as a Preventive of Lamziekte—Egg-Laying Competition—Re-stocking the Heartwater Belt—Wheat Experiments in Victoria—Sale of Grafted Vines at Tokai—Cotton Growing.

FARM AND VELD— 752—758

Liming Lucerne Lands—Curing Lucerne for Hay—Aphtha, Vesicular Stomatitis or Tongziekte in the Horse—Dosing Cattle with Common Salt—Syphons on Boreholes—Poultry Queries—Chickens unable to escape from the Shell.

EXTRA-TROPICAL FORESTRY, by D. E. Hutchins, F.R. Met. Soc., Conservator of Forests, Cape Town ... 759—772

LUCERNE GROWING BY MEANS OF IRRIGATION BY WINDMILLS. (*Illustrated*) ... 773—775

THE DIGESTIVE ORGANS OF OUR DOMESTIC RUMINANTS, by the Chief Veterinary Surgeon ... 776—781

PRIZE SHORTHORNS AT PORT ELIZABETH. (*Illustrated*) ... 782—783

MALLET EUCALYPT BARK, BETTER THAN BLACK WATTLE, by D. E. Hutchins, Conservator of Forests ... 784—789

RURAL CAPE COLONY, No. XII, by F D. MacDermott (*Illustrated*) ... 790—795

THE KOKSTAD SHOW ... 795—796

THE AGRICULTURAL UNION OF CAPE COLONY—EIGHTH ANNUAL CONGRESS ... 797—812

MANURIAL EXPERIMENTS WITH CEREALS, 1904, by Dr. Eric A. Nobbs ... 813—821

UNITED VINE AND FRUIT-GROWERS' CONGRESS ... 822—825

COTTON SEED FOR FREE DISTRIBUTION ... 826

HORSES SUITABLE FOR MILITARY REQUIREMENTS ... 827

CORRESPONDENCE— 828—836

Flood Irrigation Works at Nelspoort—The Araucaria at Graaff-Reinet—Osteo-Porosis—The Originating Cause of Redwater—Horse with Chronic Sore on Side of Head—Cool Storage for Butter, etc, in transit by Rail—Baboons and Jackal-proof Fencing—Meat Supply—A Mammoth Pumpkin—The Moon's Influences—Abnormal Milking Goats—Lime and Sulphur as a Sheep Dip—The Eradication of Scab.

RURAL REPORTS ... 837—840

NOTES ON THE WEATHER OF APRIL, 1905 ... 841—844

RAINFALL RETURNS FOR APRIL, 1905 ... 845—847

CURRENT MARKET RATES ... 848

DEPARTMENTAL PUBLICATIONS ... 849—850

THE PRODUCE MARKET ... 851—852

INDEX TO ADVERTISERS ... lxvii—lxviii

NOTES.

Useful Imperialism.

The Victoria League, which is established in England "to support and assist any scheme leading to more intimate understanding between ourselves and our fellow subjects in our great Colonies and Dependencies," has appointed an Agricultural Committee with the especial object of promoting mutual intercourse between farmers in all parts of the Empire. In pursuance of this end, the Committee will be glad to be introduced to those agriculturists from the Colonies visiting Great Britain who may wish to avail themselves of opportunities for seeing British agriculture in its varied aspects, and under the most favourable conditions. In co-operation with the Agricultural Societies of Great Britain, and with landowners, farmers and others, arrangements will be made whereby visitors introduced to the Victoria League can in their turn be introduced to some of the leading agriculturists in Great Britain, who will arrange for them to see the agricultural life of different districts. A moderate charge will be arranged for in respect of the cost for board and lodging. All communications to be addressed to Miss Talbot, Secretary of the Victoria League, Dacre House, Victoria Street, London, S.W.

"Izal" as a Tick Destroyer.

Messrs. Woodhead, Plant & Co., the agents for the powerful disinfectant known as "Izal," inform us that Mr. Elphick, J.P., of Malilane, Eastern Transvaal, reports that Redwater has been very bad in his district. He had experience of arsenical preparations, and also the ordinary fluid sheep dips regularly sold in South Africa in dipping cattle. Some little time ago he decided to try Izal, having known it as a powerful germicide for some time. Instead of dipping, he made a mixture of half-a-pint Izal in two gallons of water (1 in 52). This he sprayed over his oxen as they stood in the yoke, with an ordinary hand pump syringe from a bucket. The result answered his utmost expectations. The ticks were cleaned off, and the animals remained clean. So far from injuring them he has been delighted with its beneficial action on the skin. He much prefers it to arsenical preparations, or the ordinary fluid dips. The above method has the following important advantages :—The cost of constructing a swim bath is avoided. The quantity of fluid used is so small that the expense is trifling. Not only is there no danger, but the health of the animals is much improved. Mr. Elphick is so impressed with these advantages, that he has his oxen sprayed regularly once a week, and this ensures the destruction of any fresh ticks they may have picked up.

So many preparations are coming into the market now for the destruction of ticks that those who are really anxious to work in this direction have a wide choice. "Izal" may be as effective as any other, but it is not likely to be accepted on the statement of a single experience. Those who have worked much at tick destruction know that one can easily be misled into supposing that the particular specific used clears the ticks off when in reality the ticks clear off in the ordinary course of their life-cycle. We do not say that it is so in this case, we merely suggest the possibility. The only method of demonstration is an exhaustive series of experiments on tick-infested veld. If "Izal" will stand that and the cost works out reasonably, then there is no reason at all why it should not take its place with the other proved destroyers. It is undoubtedly a powerful germicide, but that does not necessarily guarantee that it will act economically as a tick destroyer.

Bone Meal as a Preventive of Lamziekte.

Mr. E. Howarth read an interesting paper at a recent meeting of the Central Albany Farmers' and Fruit Growers' Association on the subject of Bone Meal as a Preventive of Lamziekte. He said he did not expect to convert all present to the use of bone meal, but if he could only get one member to give it a proper trial he would be satisfied. In tracing the cause and nature of the disease he quoted from Mr. Hutcheon's work on the subject and showed it to be traceable to the deficiency of phosphates in the food. In giving his own experience he said he had been trying for the last ten years to follow on the lines laid down by the Chief Veterinary Surgeon (Mr. D Hutcheon) with the result that he lost only about ten head of cattle out of an average of 100 head, with Lamziekte, whereas before he bonemealed or gave crushed bones he lost as many as ten head a month from pure Lamziekte. He thought the result quite good enough. When he looked back 10 or 15 years and imagined what the cattle were like then, walking skeletons ready to eat up any bit of riem or tin, and as for lands, there was no keeping them out, and instead of being a profit they were a curse. Since they have had a good supply of bones they are fat, sleek and contented and more a profit than a curse. Out of 37 cows in January when it was dry he averaged 106 lbs. of butter per week.

He remembers quite well when he first started bonemealing his cattle he collected all the bones on the farm, which were nearly all from cattle that had died from Lamziekte. He had them broken up and given to the dry cattle. He then sent for a bag of bone meal, and was not particular to quality, as long as it was called bone meal. His intention was to give cows 2 tablespoonfuls of bone meal three times a week. Monday morning came round, he had a look at the weather and decided it was going to rain. Wednesday, quite out of the question, too busy. On Saturday he managed to bonemeal all the tame cows. So, instead of the cows getting bone meal three times a week, it was more like three times a month. What was the result? The cattle still died. Just about that time Mr. Berrington went to his farm and he was telling him what a fraud bone meal was. He said, "Why not do it in a proper way?" Since then he had been doing so, with the above result. It is like everything else, unless it is done properly it is waste of time and money. They might say, how does he know it is for the want of phosphates they die? What he knows is this, where they don't eat bones they die of Lamziekte, and if you give sufficient bone meal you will lose very few. Another proof is that bone meal is food. A native had some cattle running with his, only he does not allow them to go to the troughs of bone meal and crushed bone. The consequence is they are in poor condition. The previous Friday two died and on Monday morning there was another ox sick.

How to administer bone-meal.—Take 200 lbs. good sterilized bone meal, and mix it with two buckets of the best Zwartkops salt and one bucket sulphur. He gives two tablespoonfuls dry on the back of the tongue, three times a week, when they are salted, at first they may get three spoonfuls every morning; the salt helps to assimilate the bone meal. To dry cattle he gives a lick of half bone meal and half salt, one bucket sulphur also sterilized crushed bone. Of course, he can't lay down a hard and fast rule for every farm, as some require more than others. In conclusion he mentioned the high railage they had to pay on imported bone meal. He imported from Scotland two tons of bone meal and the actual freight was £2 9s. 6d. and the railage on same from Port Elizabeth to Sandflats was £3 3s. 6d. a matter of a few miles. He has got some good samples of crushed bone and meal from Messrs. Alexander Bros., Broad Street, Port Elizabeth, which he could recommend, also prices of same. After discussion a hearty vote of thanks was passed to Mr. Howarth.

Egg-Laying Competition.

Fowls and Eggs for May—an excellent monthly published in Cape Town in the interests of poultry—contains the following:—It has been now been decided to hold an "Egg Laying Contest," open to all South Africa, commencing May 1, 1906, and to extend over a period of twelve months. The contest will be held in the

Cape Peninsula, and for pullets hatched in South Africa during 1906. Entries may now be made, and as they will be limited to 24, lots will be drawn for, if the number of entries exceeds that amount. Only pure-bred birds are eligible. The rules of the English Utility Club will be observed as far as possible, and applicable to this country. Pending the formation of a South African Utility Club, or in the event of a failure to establish such a club, the control and management will be solely in the hands of the Editor of this magazine. The *Fowls and Eggs* Publishing Company will pay all expenses, and reap all profits (if any). No entrance fee will be charged. A suitable prize will be offered the winning pen, four pullets to constitute a pen. Further particulars will appear as arrangements are completed. The contest should prove remarkably interesting, as it is intended to demonstrate that poultry can be made to pay when properly housed, fed, cared for and managed.

Re-stocking the Heartwater Belt.

The valuable results which are accruing from the crusade against ticks are attracting the earnest attention of the farmers in the districts which have suffered most from tick-transmitted diseases. No district has been more heavily stricken by these pests than those of Bathurst and Lower Albany, for, while there is splendid grazing there, the country has been practically denuded of small stock for years past mainly owing to the scourge of heartwater. At a recent meeting of the Bathurst District Farmers' and Fruit Growers' Association a discussion arose on the advisability of re-stocking the coast belt. Mr. Oates pointed out that they had plenty of pasturage for sheep all the year round irrespective of droughts, which other parts of the Colony had not, but the ticks must be fought. He quoted Mr. Lounsbury's remarks as appearing in the *Agricultural Journal* relative to the immunity of Persian sheep to heartwater, and to the amount of dipping, Merinos, etc., could withstand without danger to the animal. Mr. J. Dugmore believed sheep would do splendidly on their sour veld but thought *fruit* and *sheep* would do better, and while not abating any interest in fruit-culture, he certainly thought sheep should be gradually introduced in larger and larger numbers. He was satisfied that sheep were doing better than he had anticipated—and sheep thrived amazingly where no fruit tree of any description would grow.

Mr. H. R. Duffy's experience with sheep was satisfactory from every point of view. The only danger he saw was the controlling of the tick. Whoever begins sheep farming on their sour hills must begin with Persians, thereafter gradually introducing woolled types. He had lost only four per cent. with sickness and although he lost twenty with heartwater before he dipped, he, by dipping, now farms successfully. A three or four per cent. loss per annum is nothing in sheep because the increase is so great. If he could afford it, he would get five hundred more sheep at once; it only meant that the larger number of sheep would receive more attention than a smaller flock. Ground in Winterberg where he came from was worth £4 per morgen, where they have frosts to kill any fruit-crop year after year, therefore, where they could raise an equal number of sheep per acre as in Winterberg, and could at the same time raise full crops of fruit without fear of untimely frosts, they should be able to add to the fruit-value of their land the sheep value also, within a very few years. There was more in this subject than people supposed. He might add that his second cross with Persians were doing splendidly, and it was only a question of time when they could raise wool with the best districts in the Colony.

There can be little doubt as to the promising future before these districts for stock if the re-stocking is carried on with caution and care. With the tick under control there is no reason why all the coastal belt should not carry stock for wool and meat once more, and help materially in driving the imported article out of our markets. It is all a matter of care and intelligence, and a continuous campaign against the tick. The pasturage there and the conditions are fairly favourable—the rest lies with the farmers.

Wheat Experiments in Victoria.

In a report furnished to the Director of Agriculture, Victoria (Australia), by Mr. D. M'Alpine, the Vegetable Pathologist of the department, an account is given of the wheat experiments in the past year. The objects of the work are to produce new varieties of wheat suitable to local conditions, and combining resistance to rust with a high yielding and milling quality. At Port Fairy, in addition to a larger number of small plots for testing the new varieties received from various sources, several field plots of few acres each were laid down for raising a quantity of seed of those varieties which had proved worthy in previous years of being grown on a larger scale. Owing to lack of funds, however, the mallee experiments, which had proved so successful before, had to be discontinued.

The new variety known as Rerraf, has proved very satisfactory for rust resistance, for yield and in milling quality of the grain. It was derived from a "sport" of Blount's Lambrigg, in 1894, by Mr. Farrer, wheat experimentalist in New South Wales. Two distinct types were separated from this sport, one of which, being rusty, was discarded, but the other, which exhibited great rust-resisting power, was carefully nursed for several years. In 1900 a plot of one and a quarter acre was reaped at Port Fairy, yielding thirty-one bushel per acre, and the crop was almost entirely free from rust. In 1901, when the season at Port Fairy was very favourable to rust, a yield of forty bushels per acre was obtained, the grain being remarkably fine and plump, and practically no rust was observed in the crop, though other varieties grown under similar condition were badly affected. In the mallee, at Waitchie, in the same year the best yield of the season was obtained, though the total rainfall for the year was only eight inches, of which less than six fell between the dates of sowing and reaping. The average yield in the Waitchie district that year was under two bushels, yet ten bushels per acre were obtained from the Rerraf on a piece of good fallow land. This year, at Port Fairy, forty-eight bushels per acre was reaped, the crop not manured, but following one of mangels that had been well manured.

Sale of Grafted Vines at Tokai.

With reference to the sale of grafted Vines which is to take place at Tokai on the 5th proximo, attention is drawn to the fact that 16,500 White and Red Hanepoot, grafted on Aramon Rupestris, have been withdrawn on the representation of the Western Province Horticultural Board that Hanepoot on Aramon Rupestris has proved unsuccessful.

Cotton Growing.

We would call attention to the announcement on page 826 that the Department of Agriculture is distributing small quantities of several varieties of cotton seed free to farmers for trial. It is to be hoped that the effort will receive an encouraging response, as the introduction of new crops to Cape Colony is certainly a commendable project, and in this case the difficulty of opening a market, which has killed so many such attempts in the past, is already overcome, and a fair market trial of our products is assured.

FARM AND VELD.

Liming Lucerne Lands.

A correspondent writes:—With reference to your article on lime in connection with agriculture; I shall be glad if you would reply in your Journal as to the best method of applying it to growing lucerne. The soil is black vley ground.

The liming of land for lucerne is not an operation that can be recommended for general adoption especially in a country like this where lime is not always very readily obtainable and where it is obtainable is not always of good quality for this purpose. Lime is essential to the successful cropping of lucerne and should the soil be deficient in that constituent, it is neither an easy nor an economic process to attempt to supply the deficiency artificially. But if it is considered worth the attempt, the lime, well burned and slaked, should be applied at the rate of from 800 lbs to 1,000 lbs per acre annually. It may be spread with a cart and spade in the same way as farmyard manure.

Curing Lucerne for Hay.

A correspondent asks for information on the above subject and we do not think we can do better than quote the statement contained in the Prize Essay on the subject of Lucerne Growing published by the *Midland News*. Anyone who wants to understand Lucerne Growing in this Colony should get a copy of that valuable little work. The remarks in the First Prize Essay are as follows on the making of Lucerne Hay. "To make the best Hay the field should be cut when the first flowers begin to appear. If allowed to go on until in full bloom, or until after the plants have finished flowering, the stems become hard and woody and unfit to be eaten by stock. During dry hot weather it is better to cut for hay making in the afternoon. Let it lie in the swath until the leaves are thoroughly wilted, but not dry and brittle; then rake in windrows and leave it a while, and remove it from the windrows direct to the stack or the barn. The stack is preferably made near or upon the field where the crop is cut, because every time the hay is handled the leaves drop from the stalks. The less it is shifted about, the better, because the leaves are the most palatable and nutritious part of the hay. The art of making good lucerne hay is to be acquired by practice rather than by following directions, as the quality depends upon putting it in the stack when just sufficiently cured to keep without heating, and is yet green enough for the leaves not to drop off."

We may add to the above that it is now generally recognised that it is better where possible to bale the hay on the land or ride it when in small cocks to the press, and allow it to remain for seven days by the press before pressing. The best press is that known as the "Eli," and it can be obtained for engine power or worked by a mule. The agency for this press is held, we understand, by a large producer of Lucerne Hay in the Sundays River Valley, Mr. B. K. Mayo, P.O. Bayville, of whom full particulars are obtainable.

Aphtha, Vesicular Stomatitis or Tongziekte in the Horse.

During the last month writes Mr. W. B. Gray of Vrije Gunst, Achter Paarl, I have been greatly troubled by my horses' and mules' tongues becoming so sore that they are unable to eat their forage, and I should be very much obliged if you could suggest a remedy. Their tongues become a sort of yellowy whitish colour and are covered with small jagged cuts. I have been using Stockholm Tar mixed with sweet oil rubbed in their mouths morning and evening, and when turned out to graze they are not turned loose before all the dew is off the grass, as I have been told by old farmers in the district it is caused by the dew. The tongue seems to first become sore deep in the mouth and to work backwards right to the roots with fatal results to the animal. I have known several such cases on neighbouring farms. It seems to be a disease which attacks them annually during the months of April, May, and June, but this year it is 80 per cent. worse than I have experienced it before.

The affection of the tongue, which Mr. Gray describes as being prevalent amongst horses and mules in his neighbourhood, very closely resembles the disease known as Aphtha, which becomes very prevalent in certain areas, during some seasons. I met with it first in the Eastern districts in 1884. It appeared first along the coast in the Kaffrarian districts, thence southwards towards Cape Town. It was carried to Kimberley by the Cape Police horses, that force being sent up there during a temporary disturbance. It is characterized by an eruption of vesicles on the surface of the tongue, and on the mucous membrane lining the lips and cheeks; more rarely it appeared on the outside of the lips. These vesicles are more or less circular in shape, of a yellowish colour, and slightly raised above the surface of the mucous membrane. When mature these vesicles burst, and form ulcerous looking sores, which extend and coalesce with one another, leaving the surface of the tongue and gum quite raw and painful. The disease appears to be communicable principally by direct inoculation.

Symptoms.—The animal is observed to have a difficulty in feeding, which is accompanied by a slavering at the mouth. There is also a very fœtid smell from the mouth.

Treatment.—This consists in washing out the mouth three times a day with almost any simple astringent antiseptic lotion, and for this particular affection few things answer better than a solution of sulphate of copper—bluestone—half-an-ounce to a wine-bottleful of water. It is both antiseptic and healing. But a solution of permanganate of potash, Condy's fluid, alum, or any of the antiseptic tar derivatives, such as Izal, Lysol, Jeyes' fluid, etc., will answer; the principal consideration is to wash out the mouth both freely and frequently.

The simplest way of dressing a horse's mouth is to get an assistant to elevate the horse's head, till his muzzle is level with his forehead, then quietly introduce the neck of the bottle containing the mixture into the angle of the mouth, and fill it with the mixture. Retain the head slightly elevated for a little, then lower it gently, when the horse will rinse out his mouth with his tongue as the fluid trickles out.

The success of the treatment consists in the thoroughness with which the mouth is washed out, and the washing should take place *after* feeding. If bluestone solution is used, it will do good rather than harm if the horse swallows a little.—D. HUTCHEON, C.V.S.

Dosing Cattle with Common Salt.

Mr. A. Kennedy, of Stellenbosch, writes:—"I dosed a cow (for lamziekte) with two pounds of common salt, mixed in five bottles of cold water, which she readily drank when poured into the mouth by means of a bottle. About two hours later, when I went to lift her, she was breathing her last. Do you think the dose was too strong? I found a portion of the lungs rather inflamed and containing a bloody froth. Do you think particles of salt might have got into them? She gave one or two coughs after the dose and then seemed allright.

In reply to Mr. Kennedy's communication, I am of opinion that the dose was too large; that it should not have been dissolved in cold water, and that a certain portion of the solution entered the larynx, passed down the trachea into the bronchial tubes, and set up violent irritation in the latter, and undoubtedly contributed to the death of the animal.

Common salt, when combined with Epsom or Glauber salts—(Sulphate of Magnesia, and Sulphate of Soda, respectively)—makes an excellent purgative for cattle and other ruminants. But when given alone, in sufficient quantity to act as an active purgative, it is very liable to cause violent irritation of the fourth stomach and small intestines, accompanied by symptoms of great distress, and death by gastro-enteritis. In other cases I have seen the animals develop symptoms of acute spasm of the *glottis*, almost immediately after receiving a strong solution of common salt. The animal drops down, and with head extended literally gasps for breath. The distress exhibited, and the sound emitted by the air passing through the constricted larynx, are exactly like those produced by a roaring horse, when he has been galloped until he is ready to drop from asphyxia.

As already remarked, common salt makes a valuable constituent of an active purgative drench for cattle, mixed somewhat as follows:

(1). Sulphate of Soda (Glauber Salts)	1 to 2 lbs.
Common Salt	½ to 1 lb.
Bicarbonate of Soda	½ to 1 lb.
Ground Ginger	½ to 1 ounce.

Mix and dissolve in four to six bottles of *warm* water. Large doses of salts of any kind should always be dissolved in *hot* not *cold* water.

Common salt may also be combined with Epsom salts, in equal proportions, the mixture making an excellent purgative.

(2). Take Epsom Salts	1 pound.
Common Salt	1 do.
Brown Sugar	½ do.
Ground Ginger	½ ounce.

Mix and administer as above.

For acute indigestion and congestion of the liver, common to milch cows and stall-fed cattle generally, the following treatment acts better than any thing else that I have seen tried :—

Give first 60 grains—(large oxen and bulls take 70 to 80 grains)—of Calomel. Place it dry on the back of the tongue with a flat spoon, and wash it down with a little cold water. Then, from 8 to 12 hours after, give a dose of Salts. I prefer the first recipe, but Epsom or Glauber Salts alone will answer if the other ingredients are not handy.—D Hutcheon, C.V.S.

Syphons on Boreholes.

Mr. J. A. van Zyl, of Mijnfontein Siding, writes :—" Would any of the readers of the *Agricultural Journal* be kind enough to give me some information with regard to the following? I have sunk a 6 in. hole 1,200 yards above the dam, from which I irrigate my garden. The water stands at a level of 19 ft. from the top. With a pump which delivers 25 gallons a minute, it only sinks 4 ft., that is, to 23 ft. from the top. Then I have a fall of 30 ft. to the dam near the garden, that is 7 ft. below water level in the borehole. Will a syphon work at such a long distance and at that depth? And what size of piping must I use? Then there is a 'bultje' about 4 ft. high and 100 yards wide about 200 yards above the dam. Is the syphon to work through the 'bultje' or over the top of it? I have read with great interest the answers to the questions of 'Persevere,' but they do not give me the information I require. By inserting the above in the *Agricultural Journal* you will greatly oblige."

The question of advising farmers regarding the use of syphons especially on boreholes is very difficult, unless the sites are first examined, and we would therefore merely make a few remarks with regard to the above enquiry. From the information supplied by Mr. Van Zyl regarding the levels, quantity of water, position of borehole to dam, and obstructions between dam and borehole, his erecting a syphon would not be advisable, owing to the initial cost of excavation, etc., not warranting the establishment of same. The maximum depth at which a syphon will work is 22 ft. (sea level), and at the altitude of Mr. Van Zyl's farm we do not think a syphon will draw from a greater depth than 18 or 19 ft. According to Mr. Van Zyl's figures, the supply of water tapped in his boreholes, stands at 19 ft. from the surface, but when pumping 25 gallons per minute or 36,000 gallons per 24 hours, the level is lowered to 23 ft.

The following are a few particulars *re* syphon erected on Mr. H. Nourse's farm, Dwarsvlei:—Water level in borehole, 11 ft. 6 in. from surface; 4 in. syphon inserted to 20 ft. from surface; length of syphon, 4 in., 3,600 ft.; 5 ft. or 6 ft. fall at outlet of syphon; approximate estimated daily yield (24 hours), 70,000 gallons. The most economical way for Mr. Van Zyl to utilize the supply tapped to the best advantage would be to sink a 6 ft. shaft over his borehole, or beside it, down to the water level, and then insert a suction pump at that depth, worked either by means of an oil engine or windmill.

Poultry Queries.

A correspondent recently asked:—(1) Will you kindly let me know how long fowl eggs can be kept for sitting purposes? The reason I ask is because I am using an incubator, and only have a few hens laying, so that it takes some time to get enough, and am afraid of using eggs that might be too old. (2) Also, please inform me how many hens one ought to put with each cock to ensure the eggs being fertile.

In no case is it safe to use eggs for setting which are over ten days old if one desires to be certain of the result. At the very outside the eggs should never be more than fourteen days old. As a matter of fact, the fresher the eggs that are used for hatching the better, whether placed under a hen or in an incubator

W. B. Tegetmeier, one of the most reliable authorities on poultry rearing, lays it down that three or four cockerels should be amply sufficient for seventy or eighty hens; but in such a case it would be better, if it could be conveniently managed, to place in a large separate grass run some half-dozen or dozen of the best short-legged, fine-boned, close-feathered hens with one of the cocks, and hatch all their eggs, thus ensuring breeding from the best. Great care should be taken that the birds are all in the most vigorous condition.

Chickens unable to escape from the Shell.

"Frontier," writing from Molteno, says:—"Can you kindly explain the cause of the following:—I set two lots of fowl eggs in an incubator. Very few chickens hatched on the 21st day. On the 22nd day I examined the eggs and found some were pecked through, but the chickens were unable to break them open as the white skin inside the shell was very tough. I therefore broke them open and the chicks were allright, except two which had burst in trying to get out. A lot of the eggs were not pecked, but had fully developed chickens which were dead. The weather at the time was fairly damp and they were supplied with moisture from the 14th day. As I was so unsuccessful with the incubator I put nine eggs under a hen; out of that number five hatched allright, two made holes in the shell and could not get out, the white skin round the inside of the shell again being too tough. I opened them both and the chickens were allright. On the 22nd day I opened the other two eggs and found fully developed chickens in both, but they had burst evidently in trying to get out. On making enquiries I find others are complaining of the same thing. The skin on the inside of the shell seems to be so tough that the chickens can't get out. I shall be very gratified if you can tell me the cause and how to prevent it."

After reading "Frontier's" letter, I submitted it to a friend who is a very large and experienced breeder of poultry, in order to fortify my opinion, and we both agree that although the atmosphere at the time of hatching is reported by "Frontier" to have been moist, we can give no other advice, so far as the hatching is concerned, than to increase the moisture, especially when close to the date of hatching. And this refers not only to the eggs hatched out in the incubator, but to those hatched in the natural manner under the hen. In the latter case it is always advisable, where practicable, to make the nest on the ground.

On this subject L. Wright in his book on Poultry says:—"A day or two before the eggs are "due," all which will hatch can readily be known by taking a large bucket filled with water heated to 105 degrees Fah. and immersing them in it. In a few minutes—

not always at first—the "live" eggs will commence bobbing about in a very curious manner, from the efforts of the chick within. We formerly disliked this plan; but if the hen be quiet, we now find it a good one, and the eggs may be left to soak in the warm water for ten minutes, with marked benefit to the hatching. They should be put under the hen whilst still wet." . . . "If the eggs are known to contain living chickens, yet no apparent progress be made; or if the eggs are "starred," and nothing further takes place after some hours, the chicks are probably too weakly to get out without assistance, or may perhaps be glued to the shell. Examination should be made, and if necessary the chicks must be assisted. Keep the egg in warm water (about 100 degrees) while assistance is being rendered, and success may be hoped for. The shell must be cracked very gently, and the inner membrane very tenderly peeled off till the chick be at liberty keeping all but the beak under water, till nearly clear. The operations must be performed in a warm place, and tenderly as if touching raw flesh: . . . The water greatly facilitates matters liberating the membrane, and enabling it to be separated without loss of blood. The nearly dead chick may then be put by the fire in flannel or under the hen if she is a quiet good mother—under her at night in any case."

With respect to the chicks, their strength and vitality ma y increased by an improvement in the feeding and management of the laying hens. In addition to having sufficient space to enable them to obtain healthy exercise, it is necessary that their food should be rich in nitrogenous matter, and not too fattening. Too large a proportion of mealies is not good—wheat and oats are more suitable —to which should be added some crushed bones or bone meal. I am assuming that they have either a run on the veld, or that some green food is supplied to them. I am, however, not dealing with the feeding of poultry generally, but simply indicating the necessities for the production of sound healthy eggs.—D. Hutcheon, C.V.S.

EXTRA TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries

By D. E. Hutchins, F. R. Met. Soc., Conservator of Forests, Cape Town.

(*Continued from page* 622).

(3) WESTERN DRIER COASTS DISTRICTS

With scanty but fairly regular winter rainfalls under 20 *inches, Malmesbury and north, drier parts of Caledon and east to Knysna.*

Not much tree-planting has been done in these somewhat unpromising districts. Tree planting is best confined to localities where there is subsoil moisture such as low-lying deep-soiled flats, to the borders of streams or to any high damp mountains. Of trees that have actually succeeded in such situations we may note :—

Wattles. Saligna Wattle, Pycnantha Wattle, both very hardy, and good tan bark yielders.

Eucalypts. Blue-gum (not recommended, see under "Blue-gum.") Sugar-gum, the best all-round Eucalypt: *E. polyanthemos,* (Den.) Rostrata gum (the best on brak ground occasionally flooded) *E. tereticornis, E. leucoxylon* and Crebra Iron bark stand drought and frost. These six gums yield first class timbers Besides these, the various second class inland gums of South Australia and West Australia may be tried for variety such as Cornuta, Redunca, York and Odorata Gums, *Ficifolia* (the crimson flowering gum) and *Euc. hemiphloia var albens.*

Cedars. Many of these valuable trees will stand much drought and brak. The common Cypress *Cypressus sempervirens* seems tender at first but hardy afterwards. Deodar and Torulosa Cypress above 2,000 feet elevation. Nearly all the Callitrisses and Junipers, but particularly *Callitris robusta.* This yields a soft durable timber often beautifully figured. This rather slow-growing and small though handsome little tree well merits extended cultivation here. Seed should be obtained from the drier districts of West Australia. This tree is quite hardy against drought and spreads itself rapidly by self-sown seedlings.

Pines. Jerusalem pine. Canary pine above 2,000 feet and Cluster-pine.

Other trees. Seringa in the warmer districts. Carob where its great tap root can work down to subsoil moisture. Catalpa above 2,000 feet where not too much wind. Walnut, European Olive and Cork Oaks above 2,000 feet The Walnut will usually want a little irrigation and always lime in the soil.

Mr. Raubenheimer of Schoonberg, Longkloof obtained a second prize of £25 in the tree-planting competition of 1901, for a successful plantation of *Eucalyptus globulus.* Here in the dry Longkloof the Blue-gum flourishes with great vigour, probably owing to some unusual source of subsoil moisture, as the mean annual rainfall is given at only 17 inches. This interesting plantation was raised by sowing the seed broadcast, and irrigating the ground artificially till the trees were established. Under these conditions the Blue-gum naturally grows with great rapidity. A height growth of 13 feet in 12 months from seed is said to be not unusual. At the time of the tree-planting competition there were about 20,000 trees alive, averaging 25 feet in height and three inches in diameter. Near the homestead was a fine specimen of an old Blue-gum which at 60 or 70 years of age had attained a total height of 140 feet and a diameter of nearly 7 feet.

On the eastern side of this area where the moisture conditions are increased by the topography of the ground, usually in deep damp kloofs, are found fine specimens of the Kouga Cedar, *Callitris schwartzii* (Marloth). This tree is spread over a wide area in the Willowmore Division and it is hoped that it will lend itself to planting over a larger area than the Clanwilliam Cedar *Callitris arborea.*

(4) WESTERN INNER COAST DISTRICTS

With a very scanty mixed rainfall under 15 *inches, Worcester, Robertson, Ladismith, Oudtshoorn, Uniondale.*

Most of the trees in the preceding list can be grown here in specially selected localities, but they want more care and particular selection of the ground. The ground must be open and deeply worked by pitting or trenching. Plant sparse. After planting, the trees should be thickly mulched and watered at intervals till established. Generally speaking only poor open forest of slow-growing trees can be expected on account of the fierce drain on subsoil moisture. Of course, where water is not too valuable to flood the plantations occasionally, a quick-growth and good close forest may be looked for. *Eucalyptus salmonophloia* and *Eucalyptus salubris* the two gums of Coolgardi are perhaps the hardiest trees to plant here. They flourish well in from 10 in. to 15 in. rainfall, make good stems and furnish useful durable timber largely used on the West Australian gold fields. *Eucalyptus salmonophloia* at Robertson, 12 in. rainfall, shows a better growth than either *Euc. salubris* or *Euc. polyanthemos*. *Euc. polyanthemos* is nearly as large but not so straight and well-grown. *Euc. hemiphloia var. albens* succeeds also at Robertson. If shrubby gums are not objected to, the Eucalypts of the Mallee scrubs will be found very hardy such as *Euc. incrassata* (Labill), *Euc. ochrophloia* (F. Muel), *Euc. uncinata* (Turcz), *Euc. dumosa, Euc. oleosa, Euc. gracilis* and *Euc. morrisii* (R. T. Baker) with the very large rim to the cone. R. T. Baker states that *Euc. woolsiana* or Mallee Box grows with the Mallee shrubs but becomes a tree up to 80 feet high and more than 3 feet diameter, with a good durable timber. I have not yet tried it in South Africa. It flourishes in the far interior of N.S.W. lat. 32° and rainfall 15 in. and is highly prized in the Cobar mines. *Euc. odorata* (Behr) and other stunted Eucalypts from the interior of South Australia may be tried in these localities where, as in the Worcester Karroo, the scanty rain falls mostly in winter; but in almost all such cases the Sugar Gum (*E. corynocalyx*) and Coolgardi Gum (*E. salmonophloia*) would be preferable.

The several species of Australian Callitris or Cypress Pines are specially suited to the dry country of this area. *Callitris robusta* and *Callitris calcarata* are timber trees, the former yielding the more durable timber, the latter the more ornamental timber. But neither of these is so hardy against drought as *Callitris verrucosa,* though this rarely grows beyond the size of an ornamental shrub. Particularly well suited to this area are the four small West Australian Callitrisses: *C. roei, C. drummondii, C. actinostrobus* and *C. acuminata.* Some of these will grow large enough to yield small timber and fencing posts.

(5) LOWER KAROO.

Worcester, Sutherland, Prince Albert, etc., and Beaufort West as far as Nels Poort, Jansenville, Aberdeen, Willowmore, Graaff-Reinet, etc.

Rainfall under 15 inches, in summer thunder showers, occasional stiff frosts and great summer heat.

Here are the same difficulties from drought as mentioned under the preceding type of climate. The elevation (1,500 to 3,000 ft.), the usually severe frosts and total absence of winter rains make some difference in the selection of the trees to plant. I recommend the following:—

Eucalypts.

Sugar-gum, should get a little water in winter.

Rostrata-gum, should be occasionally soaked.

Euc. creba and *Euc. sideroxylon,* both valuable Ironbarks, stand frost and drought well; and *Euc. polyanthemos,* though its timber is not so valuable, is equally hardy here. *Euc. woolsiana,* the Woolsiana gum, or Mallee Box, stands drought particularly well and becomes a tree of respectable size even on very dry ground.

E. microtheca. Stands drought and heat.

E. tereticornis, is already largely cultivated in South Africa.

E. macrorrhynca
E. capitellata
E. hemiphloia var. albens } Recommended by Prof. Maiden.

Wattles.
Acacia saligna with a little winter watering.

Cedars.
Common Cypress—hardy, handsome and profitable
Lusitanica Cypress, not so hardy here.
Deodar, with a little watering does well.
Virginiana Pencil Cedar, very hardy.
Callitris robusta
,, calcarata.
,, verrucosa.

Indigenous Trees, Callitris schwartzii, is indigenous in the gorges of the Kouga mountains.
Rhus viminalis or Krì, still fairly abundant.
Acacia horrida or Mimosa—widespread.

Pines. *Pinus halepensis* or Jerusalem pine. *Pinus bungeana,* the very hardy Chinese pine and some of the Mexican pines.

Beefwood. *Casuarina leptoclada* or Upright Beefwood. Quick-growing and handsome.

Fruit Trees. Olive—European.
Walnut. Fig.
Last two want plenty of water.

Ornamental trees. *Schinus molle* or Pepper tree.
Prunus amygdalus or Almond tree.
Quercus ilex or Holm oak.
Mulberries
Poplars
Willows } Must be well watered, particularly in spring.
Tamarisk
Robinia } Want little water.

Trees will only grow in damp alluvial hollows, fringing water-courses, or irrigated artificially. Water is too precious to turn on to timber trees, which therefore cannot be grown here with profit with the exception perhaps of Krì. The most drought-resistant trees are the Eucalypts from the interior of Australia, particularly *E. woolsiana, E. polyanthemos,* the closely allied *E. populifolia* and *E. microtheca.*

The difference between the lower and the upper Karoo is not seen at a glance. The barren stony slopes look much the same all over the Karoo, the rich but parched soil of the valleys is much the same everywhere. But the temperature differences between the lower Karoo about Prince Albert, 1,200 ft. elevation, and the upper Karoo lying at an elevation of over 4,000 ft. is very great. Prince Albert is probably the hottest place for its latitude in South Africa. The summer heat is intense—Australian rather than South African.

(Oranges, Guavas, Camphor, and other semi-tropical trees flourish when watered.) The upper Karoo with its severe night frosts is too cold for most Australian and for many European trees. Until the Orange River is reached the upper Karoo is bare of all tree vegetation, while in the lower Karoo are extensive thickets of Mimosa (*Acacia horrida*) and of the useful Kri (*Rhus lævigata*), a small tree with a bright-red-coloured durable timber.

(6) UPPER KARROO.

Victoria West, Richmond, Hanover, Colesberg, Kimberley, etc. A large part of the Free State and upper Eastern Districts, 15 *in. to* 25 *in. summer rainfall and very severe winters with* 20° *to* 25° *of frost. Drought is sometimes very severe. There may be practically no rain—not much above one inch—during a whole year. It was such a drought in* 1903 *that wiped out the Government plantation at Hanover.*

Eucalypts. No Gums are recommended for these very cold districts. Other trees are more profitable to grow except toward the north where the decreasing latitude compensates the altitude. In the warmer parts of the area most of the Eucalpyts in the preceding list may be grown with care. In the better watered eastern side of the Orange River Colony the Coreacea Gum has the best reputation as frost and drought resistant. The Viminalis Gum is probably as hardy, but neither of these yield good timber.

Cedars.

Common Cypress wants a little watering in winter.
Torulosa Cypress should be well watered in summer.
Deodar wants a little watering in summer.

Virginian Pencil-cedar.	are the three hardiest in this area.
Robinia pseudacacia Robinia	
Prosopis dulcis, The Mesquit of Texas,	

Beefwood. *Casuarina leptoclada* killed by frost in the coldest part.

Pine. *Pinus halepensis* or Jerusalem pine, does well with a little winter-watering at Hanover.

Ornamental

Schinus molle or Pepper tree does well except in the coldest part.

Tamarisk, very hardy.

Almond	The best trees for the farmer who can afford to water them. The Almond tree watered grows to a wonderful size. Spring watering is the most essential.
Mulberries	
Poplars	
Willows	

Fruit and Timber. Walnut.

The following trees require further trial :—

Pinus bungeana. Bungeana pine. China.
Juniperus chinensis. Chinese Juniper. Northern China.

Juniperus macropoda. Himalayan Pencil-cedar. Seed from Afghanistan may be tried.

Juniperus pseudo-sabina. Tibet and Himalayas.

The following North American species have been partially tried in the Government plantation at Hanover :—

Ulmus crassifolia—Cedar Elm. Mexico.

Gleditsia triacanthos, Honey Locust. Texas and widely cultivated.

Celtis occidentalis var. *reticulata,* or Palo blanco of Texas and Utah.

Maclura aurantiaca or Osage orange.

Quercus douglasii, or Rock Oak. Border of Mohave Desert.

,, *gambelii* or Gambel Oak. Mountains of Northern Mexico.

Morus celtidifolia: Mexican Mulberry. Mexico and Peru.

,, *alba tartarica*: Russian Mulberry.

Prosopis odorata (*P. pubescens*): Screw bean. Northern Mexico.

Prosopis juliflora : Mesquit. Northern Mexico.

Parkinsonia aculeata : Horse-bean. Northern Mexico ?

,, *microphylla* : Small-leaf horse-bean. Mexico Sonora desert.

Diospyros texana: Mexican Persimmon. Mexico.

Fraxinus velutina : Leather-leaf Ash. Western Texas to California.

,, *texensis*: Texan Ash.

,, *greggii*: Gregg Ash. Mexico.

Pinus cembroides; Mexican Pinyon. North Mexico.

,, *strobiformis* : Mexican White Pine. Mexico.

,, *edulis* : Pinyon. Colorado to Western Texas.

,, *ponderosa*: Bull Pine. Mexico.

,, *monophylla* : Single-leaf Pinyon. Utah, &c.

,, *ponderosa scopulorum* : Rock Pine. Rocky Mountains.

,, *aristata* : Bristle-cone Pine. Utah, &c.

,, *mayriana*: Arizona Long-leaf Pine. South Arizona.

,, *murrayana*: Lodge-leaf Pine. New Mexica.

,, *chihuahuana*: Chihuahua Pine. Mexico.

,, *arizonica*: Arizona Pine. Southern Arizona.

,, *flexilis*: Limber Pine. Utah, Nevada.

Juniperus utahensis : Utah Juniper. Utah and desert regions.

,, *occidentalis*: Western Juniper. Mountains of South. California.

,, *flaccida*: Drooping Juniper. Mountains of Mexico.

,, *monosperma*: One-seed Juniper. Utah and Arizona.

,, *tetragona*: Rock Cedar. Mountains of Mexico.

,, *scopulorum*: Rocky Mountain Juniper. Arizona and Nevada.

,, *pachyphlœa*: Alligator Juniper. Texas and Mexico.

,, *mexicana*: Mexican Juniper. Mountains of Mexico.

Cupressus guadalupensis of Arizona.

In this bleak, treeless region more experimenting with trees from similar countries abroad is necessary, but the trees growing in such localities abroad are of secondary importance, and the seed is difficult to obtain. I have endeavoured for the Hanover plantation to procure seed from Texas, Arizona, Utah, Colorado, and Mexico, in North America; also from China and the drier Eastern Himalayas. In the drier South-western side of this tract, planting is particularly difficult and expensive. The winter is so severe and dry that leaf-shedding trees are naturally indicated. On the Campbell commonage there is an indigenous scrub forest, where in sharp contrast to nearly everywhere else in South Africa (except the *Acacia horrida* scrubs) nearly all the species are leafless in winter. Leaf-shedding trees, however, suffer from this peculiar disadvantage; they naturally come into leaf with the advent of genial weather in spring, but the ground is then drought-bound, the scanty rains falling mostly in mid-summer and autumn, after the S.E. Trade has reached its full strength and spread inland in successive showers and evaporations. Very rarely, perhaps once in twenty years, is this western country visited by good winter rains, and, perhaps, once in ten years by good spring rains. It is on account of this unfavourable distribution of rain that the climate is ill-fitted to most leaf-shedding trees. The very hardy *Robinia pseudacacia* fails unless it can get water in spring elsewhere than from the clouds. The species that has succeeded the best in the Government plantation at Hanover is *Juniperus virginiana var. scopulorum*, a tree with a quite peculiar power of adapting itself to the most diverse climates. In North America it is found from the coast to the cold and drought of the elevated dry inland regions bordering the deserts.

In the drier Western side of this region, plantations of any size have been made in only three localities, viz., by the Forest Department at Carnarvon and Hanover, and by the De Beers Diamond Mining Company at Kenilworth, Kimberley. At Carnarvon (4,000 feet elevation, 10 inch yearly rainfall) planting was unfortunately discontinued after three disappointing years of drought, and just before a good year. The subsoil moisture conditions there are better than at Hanover, and the few trees planted have come safely through the phenomenal drought of 1902-03 (Van Zyl).

At Hanover the climate is more severe than at Kimberley, and perhaps more trying to trees than at Carnarvon. The elevation of Hanover (4,500 feet) is 500 feet more than at Kimberley: it lies 150 miles to the south of Kimberley, and has a considerably colder and drier climate. The mean temperature of July, the coldest month, in spite of the warm, bright days, is below that of January in England! The rainfall (fifteen inches) is three-fourths that of Kimberley, but where the climate is much more trying to tree vegetation than Kimberley, is in the strong, cold, dry, winter winds. The radiation frosts of still nights are no worse on account of its high-lying exposed situation. At Hanover, water is available only to establish the trees.

Of the trees tried at Hanover *Juniperus virginiana* and *Pinus halepensis* seemed to be the only species:

that were quite hardy under the trying conditions. These grew well without any artificial watering for five years, but were killed during the terrible drought of 1902-03, when there was practically no rain for nearly a year (three-quarter inches in slight showers) and the ground dried out completely down to the bed rock. Further planting, except for test and arboretum purposes, was then abandoned. The nursery remains, kept up for the benefit of the district. Mr. J. C. van der Byl, who had charge of the Hanover plantation for four years, and was successful in raising trees there, has furnished the following memorandum regarding tree-raising and planting in that severe climate:—

MEMO. *re* NURSERY WORK AND TREE-PLANTING IN THE UPPER KARROO HANOVER PLANTATION.

Nursery Work.

The best time for sowing is August and early in September. All Cypresses and Pine seed should be sown in August, and Gums and other fine seeds in September. Seedlings should not be picked out until summer rains have set in, *i.e.*, generally about the middle of February. Pricking out should be finished by the middle of April; if done much later than this, the plants are liable to be frost-bitten before the roots are established. Pricking out earlier in summer should be avoided as, owing to the dry atmosphere and north-west winds, thirty per cent. or more of the plants fail. I tried pricking out in the spring and early summer for three years without success; even plants raised and kept in the potting shed have gone off after being exposed to the weather, in spite of canvas and reed covering. In the autumn no difficulty has been experienced in getting plants to strike after they are pricked out.

Planting out.

Planting out in the forest should, as far as possible, be done in the early spring for leaf-shedders, and in the autumn for evergreens. Vacancies should be replaced during the winter. Where it is possible to irrigate, evergreen planting from stock tins may be undertaken with safety any time of the year.

The most suitable trees for planting are *Juniperus virginiana* and *Cupressus horizontalis*. *Cupressus macrocarpa* does well at first, but has a tendency to die off after it attains a certain height and age. For standing drought and frost nothing equals *Juniperus virginiana*. But though this tree is so hardy when planted, I have been unable to get the seed to germinate at Hanover, and all my young trees have been raised from seedlings sent up in boxes from the coast.

The best way to prepare ground for planting is by deep trenching as is usually done in planting vines. This is of course expensive and takes much time. Ridging has been a failure in most cases, especially where Cypresses have been so planted, owing to the ridges getting too dry in summer.

J. C. VAN DER BYL,
District Forest Officer.
July, 1901.

I may add that all tender nursery plants require to be very carefully protected against frost by movable screens of canvas or matting and that all nursery work is best conducted in a lath house——see below under " nurseries."

PLANTATIONS AT KENILWORTH, KIMBERLEY.

The following account of work at Kenilworth, Kimberley, will be read with interest. I took these notes in November, 1898, and December, 1903. They show exactly what is the practical result after several years' efforts at tree-planting in the Upper Karroo. These trees had no natural advantages in the way of deep soil or sub-soil moisture. The elevation of Kimberley is 4,000 feet, the mean yearly rainfall 20 inches. A great variety of trees has been tried. Many have failed. Conspicuous among the failures is the Blue-gum. It was at first more largely planted than any other tree. It has now a sickly, sometimes scarcely recognisable appearance and is steadily dying out and being replaced by other Eucalypts. Even when it can get access to water, of which it requires an enormous quantity, it sometimes dies, killed, apparently, by the dry air. Many of the unsuitable trees died during the siege of Kimberley when the Boers held the water works and the supply of water was reduced in consequence. The Blue-gum, Kari, and many of the other Eucalypts that have failed could not be planted here with any chance of success. With occasional watering the following Eucalypts have thriven well, so well indeed that the appearance of these and other trees excites the enthusiastic praises of visitors.

Eucalyptus tereticornis This appears to be the most vigorous-growing tree at Kimberley. Mr. Fenner and his assistants give it unqualified praise. The largest and best trees in the avenue are of this species which has been grown under the name of *E. resinifera.*

Eucalyptus sideroxylon. A handsome straight-growing tree frequently met with in the Kenilworth avenues.

Eucalyptus leucoxylon. This is a strong-growing, drought-withstanding tree.

Eucalyptus rostrata. This grows with vigour but not so fast as *E. tereticornis.* Mueller mentions that 9 degrees of frost killed Rostrata Gum in Italy. It stands much more than this in South Africa, for instances, 20 degrees of frost at Kimberley in 1898. None of the numerous Rostrata trees in the Kenilworth plantation seemed to have suffered from this frost. But 23 degrees of frost combined with wind the same year at Hanover killed small trees of this species.

Eucalyptus saligna. A Eucalypt like this does well in the Kenilworth avenues at Kimberley.

Eucalyptus viminalis. There are large handsome specimens of this tree with smooth bark and ample drooping foliage, but they have now ceased to plant it on account of its requiring so much water. I saw several trees dead with frost or drought, but there are still (1903) many good trees remaining.

Eucalyptus crebra. This grows here with greater vigour than near the coast; and has been largely employed in the Kenilworth plantations. Its success here accords with American experience.

Eucalyptus paniculata. This is largely represented in the Kenilworth plantations. These trees have been more recently planted and average smaller than the Sideroxylon Ironbarks. It is difficult to distinguish them as they grow there from *E. crebra.* I do not feel certain that they are not a large-fruited form of *E. crebra.*

Pepper tree. Largely planted: very hardy and requires little water. They average about 12 feet in 4 years, but after that increase slowly in height and never become the large trees one sees occasionally in summer rainfalls nearer the coast.

Casuarina leptoclada. The avenues of these trees in Kenilworth are probably the best in South Africa after those at Cradock. But it rapidly loses its dense foliage and vigorous growth if water be at all stinted and where water is withdrawn it dies.

Cupressus macrocarpa.—Is in similar case. Nowhere have I seen a finer avenue of these trees, but *Cupressus macrocarpa* cannot stand drought at Kimberley.

Cupressus sempervirens.—This at Kenilworth, Kimberley, is considered to stand drought better than *C. macrocarpa,* but I did not notice many there.

Cupressus sinensis.—Said to do well at Kenilworth, but I saw little of it.

Pinus halepensis.—This is considered the best pine at Kenilworth, but it must have some artificial watering. I saw well-grown specimens, but none large.

Robinia.—At Kenilworth this has the reputation of wanting much water. Mr. Fenner cites a quantity he put in that died out wholesale as soon as abundant watering was withdrawn.

It is now (1905) 27 years since tree-planting began at Kenilworth, Kimberley. The Ironbarks, *E. tereticornis* and *E. rostrata* have come out the best. Of the Ironbarks the largest trees are *Eucalyptus sideroxylon,* running to about 1 foot diameter and 50 feet high. They grow slowly, but present a vigorous appearance with straight stems and good crowns. The largest trees in the plantation are *E. tereticornis.*

Altogether the trees at Kenilworth, Kimberley, are one of the sights of South Africa, and no lover of trees should omit to pay them a visit. The care and expensive watering bestowed on many of them are not such as the ordinary tree-planter could afford to give, nor has the best climatic selection of trees been made. Quite unsuitable trees have been planted, and many suitable trees remain to be tried. Few, or none, of the trees of Northern Mexico, Western Texas, or Utah have been tried. I saw no plantations of the Pencil Cedar (*Juniperus virginiana*) that without watering succeeded better than any other tree at Hanover. So that interesting though the planting is at Kenilworth, Kimberley, it has not the instructive value of work under harder conditions.

On the better-watered eastern side of this region planting becomes easier, due regard being had to its bleak climate, *vide* region 10, Stormberg to Basutoland.

ORANGE RIVER COLONY.

The Orange River Colony and Bechuanaland represent the northern extension of the Upper Karoo. The trees one sees at Bloemfontein are the trees that flourish in the Upper Karoo of Cape Colony. *Cupressus sempervirens, Robinia pseudacacia, Casuarina leptoclada* and Blue-gum are the trees that strike the eye at Bloemfontein. The ubiquitous Blue-gum, quite out of place here, has been planted "not wisely but too well" for gardens where water is so scarce! Pepper trees seem to do quite well. Of the trees planted at Bloemfontein, the Den (*Eucalyptus polyanthemos*) is probably that which is best adapted to grow well without artificial watering. I saw one fine specimen of this tree in 1903. *Cupressus macrocarpa,* which was largely in evidence some years before the war, has disappeared, either cut down, or dead from natural causes, as might be expected, in the climate. The planting of trees adapted to the climate is badly needed in the sun-baked streets of Bloemfontein.

In the better watered Northern and Eastern side of Orangia trees grow very successfully. Messrs. Lewis & Marks have particularly fine plantations of Oaks (*Quercus pedunculata*) and Cluster-pine on the Transvaal border. And at Prynnsberg, Clocolan, Mr. Newberry's plantations are known throughout South Africa. In the early days of his plantations there was much loss from frost and drought owing to the planting of unsuitable trees.

Here is an account of Mr. Newberry's plantations in his own words:—

> The soil is a porous and moist sand in nearly the whole of the district called *The Conquered Territory*, so that irrigation becomes quite unnecessary, except in the nursery. The soil never gets thoroughly dry so as to crack, except in the hollows. There are also more rainy days than in other parts of the State. Notwithstanding these circumstances, favourable to tree growth, there is an entire absence of indigenous timber, though to a very small extent, on some of the hill-sides, there is a little bushwood. This may be accounted for by the immemorial practice of burning the veld, which would destroy any small seedling trees. It was this fact of the country being so bare of such a necessary as timber, and the apparent suitability of soil and climate to produce it, which induced the writer to engage in planting.
>
> Our first planting was in the summer of 1881-82. We thought it a dry season, and hoped the following season would prove more moist. In this way we have been greatly disappointed, as most people in South Africa are aware. We planted that year gum-trees, red and blue (*E. tereticornis* and *E. globulus*), about 50,000. Our numbers increased yearly, for about three years, till it reached 130,000 two years ago. Since then it has come down to 80,000. In all during the five years of our planting we have put out about 350,000 trees. But we have very far from this number at the present time alive, not more probably than 200,000 or 250,000.
>
> As everybody knows, the seasons since 1882 have been extremely unfavourable for planting, especially where it is carried on without irrigation. The last summer has been the first good season we have had since we began. Another cause contributed greatly to our comparative want of success, viz., want of experience. We hit on the *wrong kinds* to plant. Red Gum (*Eucalyptus resinifera*) and Blue Gum (*Eucalyptus globulus*) are two of the least hardy of all the gums we have tried, and we have about forty kinds. *Blackwood,* also, we have largely planted, and it is a greater failure than

any of the others. Now, after five years experimenting, we can say confidently that if we had to begin with our present knowledge of suitable kinds, and with favourable instead of unfavourable seasons, the result would have been more gratifying, and our reward ample for our labour and outlay. In speaking thus deprecatingly of our comparative want of success, I must not be misunderstood. We do not feel, after a walk through the plantations of different ages and kinds, that we have any reason to be discouraged; quite the contrary. Strangers, who call and take an interest in beautiful trees, appear to think we have been wonderfully successful. The experiment was quite new in this part of Africa

I have spoken of three kinds of trees, but we have planted others very numerously—*Italian Poplars, Willows, Pinus insignis, Pinus pinaster*, more perhaps than any others except Red-gum. The latter and Blue-gum we shall never propagate again extensively they are too tender for the climate. *Pinus insignis* is the best we have tried among the Pines, and we have tried many. Among Gums we have some six kinds that appear to be hardy here, which grow fast, and of which the wood is known to be valuable, viz., *Goniocalyx, Saligna, Rostrata, Viminalis, Gunnii*, and *Meliodora.* Some kinds, said to produce good timber (*Stringy Bark*, for instance), are difficult to transplant. The kinds above mentioned transplant easily. . . . . We get, perhaps, only ten or twelve planting days in the season, fit for transplanting evergreen trees, so we have to do our utmost during these rainy days to get out as much as possible. Deciduous trees can be moved in the autumn or spring if the ground is but slightly moist, without waiting for rain. Our planting the last summer consisted principally of *Eucalyptus rostrata* and *Pines*. We put in the year before a couple of miles of hedge composed of Broom and Gorse, both I believe eminently suited to the climate. The area covered by the plantations is about 500 acres

The common idea of the prospective profits of tree-planting seems to be that a man may plant for his children, or his children's children, but need never expect to see a return in his own lifetime, at least in any degree commensurate with his outlay I am convinced this idea is incorrect when applied to a treeless region, and where trees of the right kinds, as gums and wattles, grow up so quickly.

(C. NEWBERRY, in *Christian Express*).

Since the above was written I have had the pleasure of meeting Mr. Newberry, and being shown over the Prynnsberg plantation by him. The following are my notes on his most interesting plantations:—

NOTES ON MR. NEWBERRY'S PLANTATIONS AT PRYNNSBERG.

These are the oldest inland plantations in South Africa. They were begun in 1881 and now comprise about 800acres. The Prynnsberg Estate is situated about 6,000 feet above sea level; average rainfall estimated at about 26 in. Mr. Newberry is inclined to attribute the better growth of trees at Clocolan, Ladybrand, Ficksburg and elsewhere in the "Conquered territory" more to the deep open moist soil than to the rainfall being much heavier than in the Western portion of Orangia.

Eucalypts at Prynnsberg.—Nearly all the coast species of Eucalypts are excluded from the Prynnsberg Plantations by the severe frosts. Only the four following kinds can stand the frost there: *Eucalyptus coriacea., Euc. viminalis, Euc. gunii,* and *Euc. amygdalina.* Of these *Euc. coriacea* is the hardiest against frost, but it is tender against drought. In frost resistance *Euc. viminalis* comes next. It is preferred as growing to a much better tree than *Euc. coriacea. Euc. gunnii* stands frost well and becomes a big tree. *Euc. amygdalina* grows very fast, but is more tender to frost than either of the three above. The Eucalypts that have been most largely planted at Prynnsberg are *Euc. coriacea* and *Euc. viminalis*. *Eucalyptus resinifera* failed from frost at Prynnsberg. *Euc. rostrata* does pretty well, but it is not so hardy as the three first named above.

It is curious to note the effect of the elevation and severe climate on the natural reproduction of the Eucalypts. Unless the ground below the old trees be cultivated no young seedlings are noticeable. If the ground be cultivated, self-sown seedlings are liable to be killed off by the frost and drought of the winter. Mr. Newberry considers that of all the self-sown seedlings in his plantations there are not 100 that have finally survived. Mr. Newberry has found it impossible also on account of drought to obtain close plantations of Eucalypts. He considers that when Eucalypts are grown close there is too great a drain on subsoil moisture, for them to develop properly. Pines, on the contrary, he is able to grow close, and they form a good deposit of humus on the soil. These are facts to be remembered!

Conifers.—Of the two pines, *Pinus pinaster* and *Pinus insignis*, that have been grown there, the latter grows faster, but the former is the hardier. *P. pinaster* always shows a good crop of self-sown seedlings. Cluster pine does well on stony koppies; also *Cupressus sempervirens* and the Deodar, *Cedrus deodara*. In an ornamental avenue *Cupressus macrocarpa* did well, it was thought, till the present drought. Now the trees are dying off or getting top-dry. It is obviously unsuited to the climate. *Cupressus sempervirens* grows more slowly at first, but is suited to the climate and lasts well. *Cupressus goveniana* does well at Prynnsberg. It seems to differ only from *Cupressus macrocarpa* in the branches coming out more horizontally. This may be *C. guadaloupensis*, which should have been planted here everywhere in place of *C. macrocarpa*.

Ash.—*Fraxinus excelsior*. This is one of the few European trees that have done well, but only a few hundred have been planted, and these have had their growth checked by the interplanting of Eucalypts. I was there in winter and did not see these trees.

Oak.—*Quercus pedunculata* grows well at Prynnsberg. The Oak, the Ash, and the Plane are the only European trees tried that have been found to succeed, and they all want a moist situation. Only about a thousand Oaks have been planted. Plane, does well on the deep soil of Prynnsberg, even when not growing near water; indeed, there is very little permanent water at Prynnsberg, the dams only filling at intervals of some years.

Cedrus deodara.—This, as has been mentioned, does well at Prynnsberg. Mr. Newberry states that it grows as well as anything, but it has not been much propagated on account of difficulty with seed. One or two specimens of *Cedrus atlantica* also look well.

Bamboos.—It is curious to note that Himalayan bamboos have been well tried at Prynnsberg, and though they are not sufficiently hardy to be grown commercially, many species can be now seen showing a good growth in warm sheltered places.

Gleditschia triacanthos makes a handsome tree especially in Spring and it reproduces itself freely from seed.

With this account of Mr. Newberry's trees, may be read Mr. Wilcock's account of the climate given in his 1902 irrigation report:—

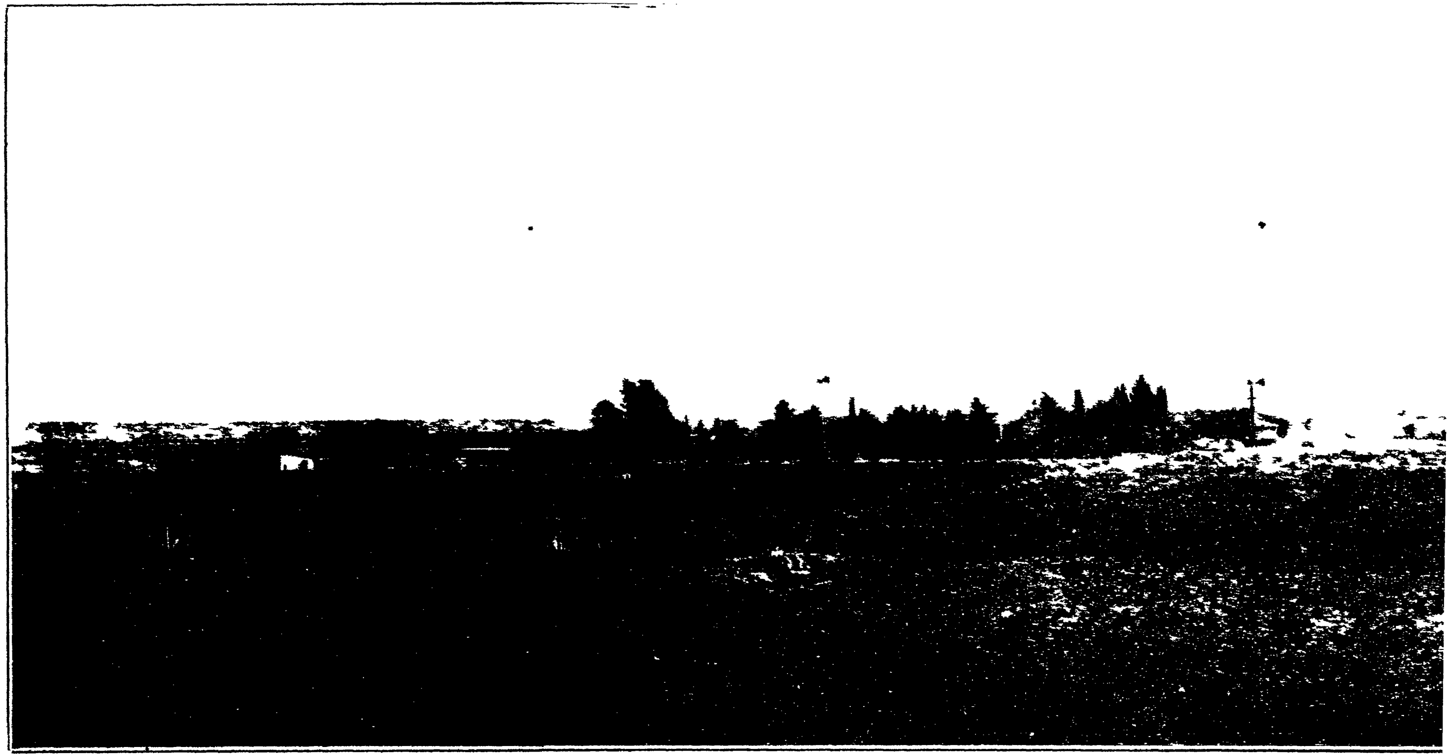
THE CONQUERED TERRITORY OF THE ORANGE RIVER COLONY.

The Conquered Territory consists of that part of the Harrismith, Ficksburg, Ladybrand, and Wepener Districts which borders the Caledon River, and which, generally speaking, drains into the Caledon River. The country lies between 4,500 and 5,500 feet above sea-level, and has a rainfall varying from 25 inches near Wepener to 30 inches at Ficksburg and Harrismith. In this territory, as in Basutoland, the rainfall is generally sufficient in August, September, and October to allow of wheat being sown between June and August and reaped in December without irrigation. The agricultural value of the land improves as one approaches the Drakensberg, as the rains are more constant. The veld is covered with good grass, and agriculture is steadily on the increase. . . . The springs are numerous. In the Karoo no springs are met with in the hills, while those in the valleys have a general discharge of four cubic feet per minute. Here the springs in the hills run to four cubic feet per minute, and those in the valleys to 40 cubic feet per minute. Such springs are collected in reservoirs, and are capable of working small corn mills."

LADYBRAND PARK.

On the Basutoland border, at an altitude of 5,000 feet, and a rainfall of about 35 inches, I found a picturesquely situated and interesting series of plantations formed by the Municipality of Ladybrand. This is termed the Lilyhoek Park, and reflects great credit on the Municipal authorities. At the entrance to the plantations are some large trees of *Eucalyptus globulus* and *Eucalyptus viminalis*. Higher up the mountain slopes are coniferous plantations—*Pinus pinaster, Pinus halepensis* and *Pinus insignis*, which here shew, up to now, quite a healthy growth. It must, however, be remembered that there is sufficient rain in the "Conquered Territory" in early Spring to allow the successful cultivation of wheat in ordinary good seasons. There are also healthy specimens of other Conifers some of them better fitted to the climate: *Araucarias, Pinus canariensis, P. longifolia, Cedrus deodara, Cupressus macrocarpa, C. sinensis*, and *Cryptomeria* To show the dampness of the climate it may be noted that Ivy and Virginia Creeper grow freely on the mountain boulders. The Lilyhoek Park is approached by an avenue of Silver Wattle (*Acacia dealbata*). This Ladybrand park is a good example of the tree-growing capabilities of the so-called "Conquered Territory" of Orangia. The first trees were planted in 1892, and the bulk of the trees during the next five or six years.

Apart from the "Conquered Territory," there is little good tree-growing country in Orangia. The central and western districts are very dry. On the extreme northern border, at Vereeniging, practically in the Transvaal, are the fine plantations formed by Mr. S. Marks.



Lucerne Fields Irrigated by Windmills, including Orchard about 10 morgen, from Ordinary Wells

Rearing Pens for Ostrich Chicks and Pigs, showing large Galvanized Iron Sheds for Storing Lucerne, &c., for Winter feed

LUCERNE GROWING BY MEANS OF IRRIGATION BY WIND-MILLS.

By A. T. Fincham, Witteputs, Griqualand West.

About six years ago I first heard of Lucerne and have never seen it grown to any extent. About that time I sowed about a quarter of an acre and watered same by means of an old Halliday Windmill pump, from a well thirty feet deep. This small piece of lucerne thrived so well that I made up my mind to increase it. Water was the question. Well to overcome this I had to dig five wells and tunnel them all together, this making a large under-ground reservoir. When this was completed, I purchased two Dandy Wind Mills 16ft. wheels, 40ft. towers, 6in. suction and delivery pumps with 10in. cylinders. These two wind mills discharge their water into a stone reservoir built on top of the soil holding 100,000 gals. of water, this reservoir is built of stone with lime mortar and stone cemented floor. By the time these were erected I had cleared and levelled a piece of land 300yds. by 300 yds., and in January, 1904, I was able to commence sowing lucerne. I prepared my lucerne beds, making them very even and with a slight slope. I managed to sow and successfully grow about 100 yds. by 300 in that year and have had five crops up to now, the sixth crop I hope to reap about the end of April. I have now managed to fill up the whole space of 300 by 300 yds. with lucerne, and besides this I have an orchard of 150 by 100 yds. and about 100 pepper trees. These are all supplied by the wind mills.

You will notice in the photos sent that I have arranged rearing pens for Ostrich Chicks, and also for pigs. We have had no rains for three years, and I have had to feed 12 cows, 15 horses, 8 mules, 36 ostriches, 20 brood mares with foals, also 100 Persian ewes and 50 merino sheep, and I can candidly say that this bit of lucerne has been my salvation.

I consider an acre of lucerne will yield five crops from September to April and each crop will cut 12 to 15 bales of 150 lbs equal to 4½ tons if well irrigated. The best way is to make the beds about 5ft. wide and from one hundred to 120 yds long with a gentle slope, this of course greatly depends on the method of irrigation. I am convinced that no farm should be without a morgen of lucerne as it is the farmer's friend in time of drought.

THE DIGESTIVE ORGANS OF OUR DOMESTIC RUMINANTS.

By the Chief Veterinary Surgeon, D Hutcheon, M.R.C.V.S.

Our domestic ruminating animals have four stomachs, called the *Rumen, Reticulum, Omasum* and *Abomasum*. Physiologically considered, however, there is only one true stomach, the abomasum or fourth stomach in which the digestion of the food occurs. The other three cavities are really large dilatations of the œsophagus in which the rough vegetable food undergoes certain processes of maceration, and trituration, preparatory to being digested in the fourth or true digestive stomach.

The first Stomach—The rumen or paunch constitutes about nine-tenths of the volume of the four stomachs, and occupies about three-fourths of the abdominal cavity, and in large animals is capable of holding about 60 gallons. When viewed externally it appears to be divided into four unequal portions by grooves or constrictions. When the rumen is opened these constrictions are seen to consist of strong muscular ridges or bands, which incompletely divide it into four unequal compartments, which freely communicate with one another. These muscular bands assist in bracing up the organ, and when they contract tend to concentrate the organ so as to press the food towards the entrance of the œsophagus. Like all the hollow organs in the abdomen, the rumen has three coats or coverings which constitute its wall. The *serous* coat is outside, the *muscular* coat in the middle, and the *mucous* coat forms the inner coat or lining of the organ. The serous covering is that clear glistening fibrous membrane, which forms the outer covering of all the organs of the abdomen and which lines the abdominal cavity itself. A large double fold of this membrane arises from the rumen, and forms a sort of apron which covers the bowels, and is called the omentum or caul. In animals in good condition it is generally covered with fat.

The *muscular* or middle coat is very thick in this stomach, especially in the bands already mentioned. Its fibres are arranged in several layers, and present unmistakable transverse striation or cross markings, seldom met with in the involuntary muscular tissue of the internal organs. The function of muscular tissue wherever it is situated is to contract, and by its contraction it performs all the movements of the body, voluntary and involuntary. Anyone acquainted, with the size of this organ in ruminants, and the mass of food which it is capable of containing, will readily perceive the necessity for its possessing a thick muscular coat to enable it to contract upon its contents and keep them moving in addition to performing the act of rumination, which will be considered presently. The *mucous* or inner coat of the rumen, presents a rough looking surface. This is produced by an immense number of small elevations or papillæ which grow out from the mucous membrane and cover the whole of its surface with the exception of the muscular bands. It is necessary to explain that the rough appearance which these papillary prolongations present is due to the epithelial membrane which covers them. This epithelial membrane forms a protective covering to the whole of the mucous membrane, throughout the entire digestive track from the mouth to anus, just as the epidermis or scarf skin forms a protective covering to the true skin over the whole surface of the body. In places where there is little friction such as the fourth stomach and small intestines it is very thin, and may consist of a single layer of epithelial cells, while in other situations where the friction is considerable, such as on the surface of the tongue in the ox, and in the rumen which we are at present considering, it is very thick, consisting of a number of layers of cells firmly united together into a strong cohesive membrane. It is simply an inert insensitive rough pellicle, having neither blood vessels nor nerves, but derives its nourishment from the mucous membrane on which it rests, and which it protects from injury. Experienced farmers will have observed, when making a *post mortem* examination of an ox or sheep, which has been dead some time, that what they call the inner lining of this stomach—which is this rough epithelial covering—peels off completely, leaving the mucous membrane exposed as a pale pinkish looking membrane, with a number of small elevations or *papillæ* on its surface, these being larger and more prominent in some parts than in others. But few glands are found in the rumen, and these are simply of a mucous type.

The Second Stomach.—The *reticulum* so called from its inner surface somewhat resembling a net. It is also called the "Honeycomb" for the same reason. It is the smallest of the four stomachs in the ox, but the third stomach is the smallest in the sheep and goat, nevertheless it is generally known by the farmers as the small stomach or "klein pens." The net-like appearance which the inner surface of this stomach presents is due to the mucous membrane being elevated in ridges, which are arranged in hexagonal form, with mathematical precision. On closer examination it will be observed that each large cell is divided into smaller spaces by secondary, and successively decreasing divisions. The mucous membrane of the reticulum is covered by epithelium in a manner similar to the rumen, but the epithelial membrane is not so thick, although the superficial layers of epithelial cells are of the same horny character as in the rumen. The muscular coat is similar in character and arrangement to that of the rumen, and its outer or serous coat calls for no special remarks. It is of interest to note, however, that when such substances as stones, nail, pieces of wire, needles, pins, &c., are swallowed by ruminants, they are generally found lodged in this stomach or sticking in its mucous membrane. In numerous cases these pins, needles, or pieces of wire penetrate the walls of this stomach, pass through the diaphragm and become ultimately lodged in the heart or lungs, their course being directed forward by the movement of the abdomen and thorax in the act of respiration. Before describing the third stomach it is necessary to direct attention to an open channel or canal called the *œsophageal groove*; because it appears like a continuation of the œsophagus. Commencing at its termination in the rumen this groove passes over the roof of the reticulum, and enters the third stomach. It is from six to eight inches long, and its two lips or borders are composed of longitudinal bundles of muscular tissue. The epithelium covering the mucous membrane lining the inside of the groove has the same smooth character and pale pinkish appearance as that of the œsophagus, but on the two borders it is rough and corrugated. This groove will be referred to again when discussing rumination.

The Third Stomach.—The *omasum* called also the *psalterium* or *leaf stomach,* manyplies or manyplus. This stomach is situated between the reticulum and the abomasum or fourth stomach, and communicates with both, but the right orifice opening into the abomasum or fourth stomach, is much wider than the left opening which communicates with the reticulum. When full this stomach is oval in form, and is slightly curved in an opposite direction to the reticulum. As Chaveau says, this compartment or stomach offers one of the most curious arrangements met with in the viscera; being filled by unequally developed leaves of mucous membrane which follow the length of the cavity. These leaves or laminæ commence at the side of the orifice leading from the reticulum by a number of ridges which are covered with small conical-shaped papillæ. These papillæ on the leaves are larger and firmer at the reticulum end, and become gradually smaller as they approach the entrance to the abomasum. The food substances between the leaves are also finer at the lower end than they are where they enter at the upper end. It will be observed also that the leaves of this stomach although arranged in regular order are of very different sizes. A number of these situated in the centre extend almost the whole width of the cavity of the stomach; between these again some are half the width, others are a quarter of the width only, while others vary from an inch broad to an indistinct ridge or line. Some of the broadest leaves have secondary small leaves running along their middle, some on one side only, others have them on both sides. This is very marked in the Giraffe. The spaces between the leaves are generally filled with finely ground food substances which rarely contain much moisture, and very frequently the food contents are dry and compressed into hard cakes. As Ellenberger says, this stomach has no secreting power, its function being to compress and triturate the food which it crushes, between its muscular leaves, and rasps down by means of the papillæ. Hence the natural action of the stomach is to press out the fluid portions of the food into the fourth stomach. The structure of the leaves consists of two layers of mucous membrane laid opposite to each other, with two layers of muscular fibres between, and blood vessels which ramify up the centre between the muscular layers. It is said to have a separate nerve supply. Irritation of the pneumogastric nerve produces contraction of all the other stomachs but this one. The epithelium which covers the surface of the leaves is thick and tenacious and peels off in flakes when the stomach has been the seat of congestion or inflammation or when the *post mortem* has been some time delayed.

The Fourth Stomach.—The *abomasum*, called also the rennet and milk stomach, is pear-shaped in ruminants, wide at its opening from the omasum, becoming narrower until it terminates at its lower end in a constricted passage leading into the bowel, its entrance there being guarded by a strong muscular ring called a sphincter. This is the true digestive stomach of ruminants, and consequently its inner or mucous membrane corresponds in character and appearance to the mucous membrane of monogastric animals such as the dog, pig, and right side of the stomach of the horse. It is reddish in colour, smooth and vascular, and covered with a thin layer of epithelium. Its mucous membrane is thinner than that of monogastric animals, but it has a much greater surface on account of the numerous folds or plaits which cross its surface in an oblique manner. Its muscular and serous coats call for no special remarks.

Rumination—Ruminants are distinguished from other animals, by the faculty which they possess of being able to swallow their food when it has been but very imperfectly masticated, and] of bringing it up into the mouth again for a second and more complete trituration. When a ruminant is feeding, the coarse and roughly masticated food passes into the first two stomachs, principally the first, while portions of the fluid and pultaceous constituents of the food may enter all four compartments. But the great bulk even of these enters the first two stomachs. It was the general opinion formerly that fluids passed directly, and entirely, into the third and fourth stomachs, when the animal drank, or when fluids were slowly administered to it. But Flourens proved by making fistulous openings into all four compartments that immediately on drinking, fluids entered all four stomachs almost simultaneously.

It is evident, however, that the largest portion of fluids and soft foods enters the first two stomachs, otherwise it would be impossible to account for the quantity of fluid which is invariably found in these two compartments, especially in the second, as they are but sparingly supplied with glands, and incapable of furnishing a secretion of their own. Besides the act of rumination could not be performed unless the first two stomachs contained a certain quantity of fluid. And in addition there is the fact abundantly verified by experiment, that the greater portion of such food substances as soft bran mashes fall into the rumen, and do not pass, but in small quantities directly along the œsophageal groove into the third and fourth stomachs.

Maceration of the Food.—The food in the rumen is subjected to a slow churning motion by which its constituents undergo a certain amount of division, and become thoroughly mixed with the fluids of the stomach which are principally saliva, mucus and water. As this churning motion affects the whole mass of food contained in the rumen, it is very evident that the food which is newly swallowed becomes speedily mixed with the portion of food already there, and the rumen is never quite empty, no matter how long the animal may have fasted before. It will be evident therefore that the food which enters the rumen first is not necessarily the first to leave it. The time which food remains in the rumen depends upon its character, and the amount of preparation which it requires. Further, as Steel says,—"Coarse food may be remasticated as many as four or five times, and a considerable portion of the food which enters the rumen requires no remastication at all. These are such food substances as are capable of being reduced to a pulpy mass by maceration in the fluids of the rumen, and such as are capable of being acted on by the saliva, or dissolved in the other fluids, and rendered fit for passing directly to the other stomachs without remastication.

The Act of Rumination. The opinion previously entertained until experiment disproved it, was, that the food is passed from the rumen into the reticulum, where it is moulded into a ball, and by an energetic contraction of that stomach it is forced into the œsophagus, and returned to the mouth. After its remastication, and descent down the œsophagus, either from being of a softer consistence, or not being so violently driven down the gullet, or by some instinctive influence, it passes along the œsophageal groove or canal without separating its pillars, and enters the maniplus or leaf stomach. At the present time there is still a difference of opinion whether it is the first or second stomach or both combined which forms the cud, and forces it into the œsophagus to be returned to the mouth. Simonds, Bourgelat, Chaveau, and others are of opinion that the food for remastication is propelled by the rumen alone into the œsophagus, while Colin, Daubner, Steal, Meade-Smith and others, consider that the assistance of the reticulum or water-bag as it is called, is necessary, and this view appears the more probable because the reticulum invariably contains a quantity of fluid, and the cud as is ascends the œsophagus is always accompanied by a certain amount of fluid which can be heard to rush down the gullet again as soon as the cud is grasped in the mouth. Steel thus describes the act of rumination:—"The muscular bands of the rumen are so arranged that when they contract they concentrate the organ as it were towards the terminal extremity of the œsophagus. At the same time contraction of the reticulum also occurs, and thus the alimentary material is pressed into the lower end of the œsophagus, and passed upwards in pellets into the mouth. Such is the arrangement of the œsophageal groove that when its longitudinal bands contract, they tend to place the terminal opening into the third or leaf stomach opposite each other connected practically by a canal out off from the cavity of the rumen by the contraction of a sphincter. When food has been pressed into the canal by contraction of the first and second stomachs, a sufficiently large portion is cut off from the rest by contraction of the sphincter and thus the pellet to be returned to the mouth is formed."

But in addition to the contraction of the first and second stomachs, contraction of the diaphragm and abdominal muscles is also necessary to the act of rumination, and aspiration assists its onward movements also. As soon as the cud enters the lower end of the œsophagus, it is carried to the mouth very rapidly, only about four seconds elapse from the time of the swallowing of one bolus, before the next is formed and ascends to the mouth. (Meade Smith).

As soon as the ball of food termed the cud enters the mouth, it is subjected to a second and more thorough mastication than the first; at the same time it is thoroughly incorporated with saliva before it is reswallowed. When the remasticated cud is swallowed, the greater portion of it again enters the first and second stomachs, only a limited quantity of the finely divided pulpy food and fluids passing along the œsophageal groove direct to the third and fourth stomachs.

As Professor Simonds pertinently remarks, "if the remasticated food descended directly into the third stomach, we should expect to find that organ of a proportionate size to contain as much as would undergo the process at one rumination." . . . . " The omasum is, however, far too small in the ox for such a purpose, and in the sheep it is relatively smaller. Besides, as already remarked, soft pulpy food, which requires no mastication when first swallowed, enters the rumen, then why should such food not enter the rumen when swallowed after a second mastication? It would appear therefore that a comparatively small amount of the food of ruminants passes directly to the third and fourth stomachs by means of the œsophageal groove, the great bulk of the food substances when swallowed whether after the first or subsequent mastication, falls into the rumen, where, after it is properly macerated and prepared it is passed on to the reticulum, thence into the omasum through the narrow opening which separates it from the reticulum. This narrow opening from its connection with the œsophageal groove guards against the entrance of coarse and improperly masticated food, which may be presented to it by the reticulum. It is evident, however, that a considerable portion of the solid constituents of the food undergoes a further pulverization in the third stomach as it is passed onwards between its denticulated leaves. This is clearly shewn by the fact, already referred to, that the food contained between the leaves of this stomach at its entrance from the reticulum, is much coarser than that found between the leaves, at its exit into the abomasum. The papillæ on the leaves are also much larger and firmer at the upper end of the leaf stomach, than they are at its lower end. The fluids and properly prepared portions of the food are not retained between the leaves, but pass on to the fourth stomach through the channel in the centre or inner curvature of the leaf stomach.

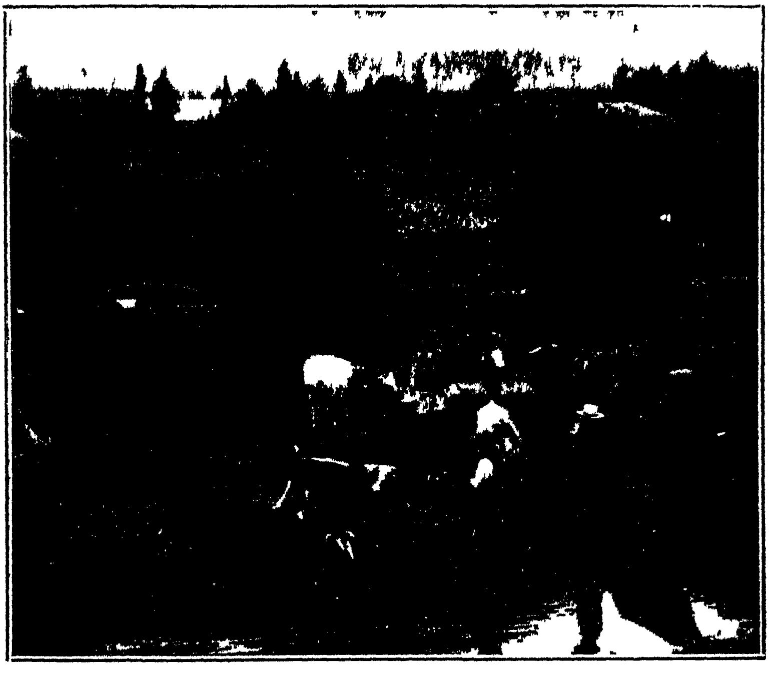
Briefly then the first three stomachs of ruminants are simply cavities or dilated pouches of the œsophagus, in which the coarse vegetable foods which these animals, for the most part, feed upon, are prepared for digestion in the fourth or true digestive stomach.

PRIZE SHORTHORNS AT PORT ELIZABETH.

The exhibits of shorthorn cattle at the last Port Elizabeth Show though they might have been better and more representative, were a fairly good lot taken all round. They were not a strong section, a fact which was undoubtedly traceable to the prolonged drought, for the Midlands and Eastern Province together with the Orange River Colony should be in a position to put forward a much better exhibit had the season been propitious. The shorthorn, with all his virtues, has not made that deep impression upon the cattlemen of these Colonies which his admirers and advocates would wish, but where the breed has become acclimatised it seems to have done well enough to maintain its position. It is interesting to be able to reproduce photographs of some of the prize winning stock at Port Elizabeth more particularly as it came from the neighbouring Colony across the Orange River, for it is evident that the shorthorn has caught the eye of some of the more prominent breeders of the O.R.C. and we may, therefore, expect to hear more of this breed in the future from that quarter. Appended are the photographs alluded to :—

Pompom, First Prize imported Shorthorn bull, 3 to 4 years old The property of Mr. John Dewar of Vlissengan, near Zastron, O R C

GERALD, First Prize, Colonial bred Shorthorn bull 1 to 2 years old The property of Mr John Dewar, of Vlissengan, near Zastron, O R C



Family of Shorthorns. The property of Mr John Dewar of Vlissengan, near Zastron, O R C.

MALLET EUCALYPT BARK, BETTER THAN BLACK WATTLE.

A New Forest Industry for the South-West of Cape Colony

By D. E. Hutchins, Conservator of Forests, Western Conservancy.

The *Natal Agricultural Journal* for March opens with an article on the so-called "Mallet Bark" of West Australia. The article is by Mr. T. R. Sim, the Natal Conservator of Forests, and furnishes a full page figure and much useful information regarding Mallet Bark, which is stated to be the produce of one of the West Australian Gums, known botanically as *Eucalyptus occidentalis. Eucalyptus occidentalis* is a small or medium sized Gum tree allied to the well-known Cornuta gum, so commonly planted as a wind-break and screen in the Cape Peninsula. This matter was no doubt given prominence in the *Natal Agricultural Journal* on account of the important position which the Wattle bark industry has assumed in Natal. As was stated in a recent number of this *Journal* (September 1904) the Black Wattle (*Acacia decurrens*) is now yielding produce in bark and firewood worth £100,000 annually. If Mallet bark deserves prominence in the *Natal Agricultural Journal*, it deserves still greater prominence in the *Cape Agricultural Journal*, since *Eucalyptus occidentalis* is at home in the South-west of Cape Colony, while in Natal it can only be grown as a climatic exotic. When we read that since 1903 about 5,000 tons of this bark have been exported yearly from West Australia, that a greatly increased export is expected for 1905, and that the bark is said to contain from 35 to 40 per cent. of tannin, and sometimes half its weight of tannin, we have here a matter which evidently deserves the attention of every landowner in the South-west of Cape Colony, particularly the drier districts. The Common Saligna Wattle or Port Jackson Willow of the Cape Flats averages about 20 or 23 per cent. of tannin, Black Wattle about 25 or 30 per cent. and Pycnantha Wattle a little more. When therefore we read that the bark of the Mallet gum tree yields 40 per cent. of tanning matter, it is evident that we have here a bark of very great value, in fact, of higher value than the Black Wattle of Natal, which produces, as I have said, £100,000 yearly for that Colony. The article in the *Natal Agricultural Journal* concludes with a comparative analysis of Black Wattle and Mallet bark by Mr. A. Pardy, F.C.S., of Pietermaritzburg, the Mallet bark being a commercial sample from Europe and the Black Wattle grown in Natal.

	Black Wattle.	Mallet Bark.
Soluble matter . ..	47·90	51·48
Non-tannin	11·94	12·23
Tanning matter	35·96	39·35

It may be desirable later to reproduce the article in the *Natal Agricultural Journal.* In the meantime, I may summarise some of the interesting facts in it. It seems that last November year attention was drawn in Europe to a new tanning material arriving in considerable quantities from Western Australia, and which threatened to have a prejudicial effect on the sale of Natal Black Wattle bark. The source of this new Australian bark was not then known, though shortly afterwards Mr. H. Von Bulow of Dalton informed the Natal Conservator that he had ascertained that it was the bark of *Eucalyptus occidentalis,* and that it yielded the following analysis :—

Tanning matter	49·5 per cent.
Non-tanning matter	6·6 „
Water	18·8 „
Non-soluble substance ...	25·1 „

Mr. H. Von Bulow is an authority on Wattle bark, he having large mills in the centre of the Natal wattle growing districts, where the bark is received, ground and exported. It will be noted that Mr. Von Bulow's figure of 49·5 per cent. tannin is not supported by subsequent data. One can hardly imagine a bark so rich as to contain one-half its weight of actual tanning matter. Last January the Director of the Imperial Institute wrote that since 1903 considerable quantities of a new bark, had been placed in Germany, principally through Hamburg, under the name of *Mallet rinde,* and in France, *via* Marseilles, under the name of *Malletto.* He adds that Mallet bark appears to be free from the red colouring matter which is an objection in other Eucalypt barks. It is free also from the reddish tints given by Wattle barks, Mallet bark yielding a firm leather, yellowish in colour. The present selling price of Mallet bark in London is from £12 10s. to £13 per ton, against £10 to £13, the price of Black Wattle. "So far Mallet bark has not appeared to any extent, if at all, on the English markets, but there can be little doubt that if it produces leather free from the pink tint characteristic of Wattle bark and is as rich in tannin as is stated by the German importers it will meet with a ready sale in this country when once it becomes known." On January 24th Mr. J. H. Maiden, Director of the Botanical Gardens, Sydney, wrote "In reply to your letter referring to Mallet bark, I beg to inform you that this name is applied to the Flat-topped Yate (*Eucalyptus occidentalis*) of West Australia. The name Mallet bark has been invented by the persons who are interested in exporting the bark—no wonder you could not trace it."

The following information was supplied by the Forest Department of Western Australia :—

"The bark referred to is obtained from the tree locally known as the Flat-topped Yate (*Eucalyptus occidentalis*). Various analyses of the bark show that it contains from 28 to 45 per cent. of tanning matter. Many thousands of tons have been exported during the last two years. *Eucalyptus occidentalis* is distributed over a large area of country on either side of the Great Southern Railway line, as shown on litho. herewith, but I am unable to give any estimate of the quantity still available, as this tree is said to extend to a very considerable distance to the eastward of the line. The Mallet is only to be found in natural bush."

The area occupied by the Mallet gum, as shown in a sketch map in the *Natal Agricultural Journal,* is seen to extend from Tenterden to Beverley on the main line of Western Australia, which runs from Perth to Albany. Tenterden is in the same latitude as Cape Town. Beverley is in latitude 32, that is to say, the latitude of Clanwilliam, so that the flats and low mountains from Wellington to Clanwilliam would mark the natural region of the growth of the Mallet gum in South Africa. The rainfall limits within this belt vary from 20 to 15 inches, and thus all the dry South-western country with light winter rains—Robertson, Worcester, Caledon, Tulbagh and Clanwilliam, fall within the natural limits of the Mallet bark gum. In a stunted form it would probably flourish in drier regions still, such as Van Rhynsdorp and part of Calvinia. The Mallet gum may be worth cultivating further along the drier coast districts so far as there are winter rains—Oudtshoorn, Willowmore, Uniondale, Humansdorp, and perhaps some distance further east. A District Forest Officer of the Natal Forest Department, Mr. Kelly, who knows the Mallet gum country in Australia, describes it as a wilderness of scrub, mostly uninhabited, excessively dry and containing trees of timber size only along the river beds. Mr. Sim comes to the conclusion that the Mallet bark gum is not likely to have a lasting effect on the Natal wattle industry. I am entirely with him in thinking that its artificial cultivation in Natal is never likely to vie with the cultivation in Black Wattle there. It is unlikely that the Mallet gum will grow at all well in Natal. One must see the Black Wattle to realize how vigorously it can grow in Natal.

I now come to the Mallet gum as we know it in the Cape Peninsula. In the Tokai arboretum, where is to be seen nearly every extra-tropical species of *Eucalyptus,* a West Australian species would naturally not be absent. Close to the road going up to the old nursery at Tokai, among the "forty-tree" plots is a plot of *Eucalyptus occidentalis,* vigorous growing young trees which at 2½ years from seed and 2 years planted have now an average height of 6 feet 6 inches and a maximum height of 11 feet.

MALLET BARK GUMS IN THE TOKAI ARBORETUM.

No. of Trees.	Height.
1	11 feet.
9	9 "
3	8 "
8	7 "
7	6 "
4	5 "
1	4 " 6 in.
4	2 "
37	

The general appearance of the trees leaves nothing to be desired. Now, at the end of summer—and a particularly dry summer—they are shooting up with the strong red shoots of a eucalypt in vigorous growth. There are no blanks, and the trees show generally a complete climatic adaptability. The soil here is the ordinary red Constantia loam of the Tokai arboretum with a stiff clay subsoil a few feet below the surface. Some years ago the red loam of the Tokai arboretum was analysed and declared to be too poor for most agricultural purposes. That it is quite good enough for the various species of Gums is shown by the fine growth of most of the Eucalypts that have been planted here. The general appearance of *Eucalyptus occidentalis* in the Tokai arboretum recalls somewhat that of *E. sideroxylon,* the well-known Ironbark of Victoria, and the tree which, with its black rough bark, shows out so conspicuously in the Tokai arboretum. In its bright red top shoots *E. occidentalis* somewhat recalls Jarrah. For a medium-sized Eucalypt with light cover and a dry-country tree, one could not wish for a plot of Eucalypts showing a more satisfactory appearance than the trees in the Tokai arboretum.

Eucalyptus occidentalis, as appears from Mueller's description in the "Eucalyptographia," "occurs in West Australia from the Tone River to regions inland near Cape Le Grande and the Broken Ranges near Orleans Bay, forming part of the scrubs, known to extend about 40 miles northward of Edicup and to ascend high up to the Stirling Range, occurring on clayey as well as on sandy soil, also occupying wet places."

The Stirling Range are low mountains not more than 1,500 ft. generally.

Mueller adds that it occurs as a shrub up to 20 feet high and "in favourable localities, such as sheltered valleys with better soil and on banks of streams, as a tree rising to 120 feet." Planted by Mueller in the Melbourne botanic gardens, it proved of rapid growth. Mueller describes old trees as having partly smooth bark, the outer rough, corky, and somewhat fibrous portion falling off in thin hard pieces. The limbs of the tree have smooth whitish bark. The branches are more erect than spreading, forming a compact head of foliage which is flat on top, giving the tree an almost funnel-shaped outline. Bark of twigs reddish brown. Heart-wood dark, the other portion of the wood pale.

In spite of what Mueller says about *E. occidentalis* growing occasionally to a height of 120 feet, I have never seen it mentioned amongst the timber trees of Western Australia. "The Forests of Western Australia," by Ednie Brown, which is the best account yet published of the forests of Western Australia, in its list of timber trees, does not mention *E. occidentalis,* the Flat-topped Yate. Mueller's "Forest Resources of Western Australia," published in 1879, also makes no mention of *E. occidentalis,* though he remarks: "Mr. Muir noted a variety of Yate, which has the mass of its foliage flat-topped."

Eucalyptus occidentalis not being a timber tree, I have not stocked it, and there is at present no seed in the Government Seed-store.

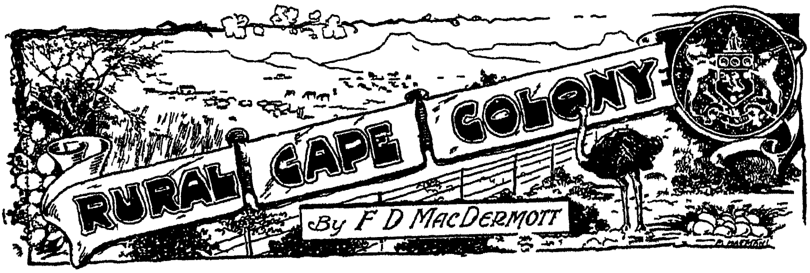
Eucalyptus occidentalis gets its name of "Flat-topped Yate" because its general appearance is like the Yate with a particularly flat top. Yate is the common Australian name for *E. cornuta. E. cornuta var. symphyocarpa* is the bushy tree so well known to every one in the Cape Peninsula, the tree with the cones growing into a woody mass, sometimes the size of a baby's head. The flower buds have pointed caps, from which name it is often called "Prickly Gum" amongst the Western farmers of Cape Colony. The Forest Department people now generally call it the "Bushy Cornuta Gum," but for years it was known as the "Cornuta gum." Now, however, that we have got the "tree" Cornuta gum which grows to a fair-sized tree, it is necessary to distinguish the old bushy form which has so long been grown as a wind-break in the Cape Peninsula and the South-West. The "bushy-Cornuta" Gum has been so long cultivated that it has become widespread in South Africa. Not long ago I found it growing in the northern Transvaal, and two years ago, on a farm near Salisbury in Rhodesia, I found our old friend making the best of his unaccustomed surroundings and growing vigorously under the very altered climatic conditions. Of course, how long the "Bushy" Cornuta will last in Rhodesia, or if it lasts, how much it will resemble the original Cornuta of Australia and the Cape Peninsula, is another matter. The "tree" Cornuta was one of the first discovered and earliest described of the Eucalypts. Monsieur Labillardière, when naturalist to Admiral D'Entrecasteaux's expedition in 1792, found it growing at Cape Leeuwen, the extreme south-western point of Australia.

Turning now to the botanical aspect of the "Mallet" gum, the first question that arises is, are we quite certain that we have got the correct botanical name? Mr. Sim states that Dr. Morrison, in the *Journal of Agriculture* of Western Australia, for September, 1904, authoritatively identifies the Mallet Gum as *E. occidentalis.* We must, therefore, accept this identification as correct; but the question may arise whether Mallet bark is furnished only, or indeed chiefly, by *Eucalyptus occidentalis.* Maiden states that the name Mallet bark is a trade invention. It seems more likely that it is a corruption of the native Australian name "Maalok." Mueller, in his classical work on Eucalypts termed "Eucalyptographia," refers "Maalok" to *E. obcordata.* Be this as it may; it will be safer in procuring seed to get it direct from the trees that are being stripped along the West Australian railway, and which trees furnish the commercial Mallet bark, rather than to confine one's efforts to the botanical *E. occidentalis.* Therefore, immediately on receipt of the *Natal Agricultural Journal,* with the account of this new forest product, I wrote to one of my oldest seed collectors, who happens to be living in the West Australian Mallet country, and asked him to send me some Mallet gum seed. I also addressed a similar request to the Forest Department of Western Australia. I hope, therefore, shortly to be in possession of seed, which, whether or not it be *E. occidentalis*, will be that of the Eucalypt, which produces the Mallet bark of commerce.

There is a good full-sized drawing with a botanical description of *Eucalyptus occidentalis* in Mueller's Eucalyptographia. He describes it as having yellowish flowers. Our Tokai trees show white flowers slightly tinted with yellow. The cones of *E. occidentalis* are happily distinctive enough to prevent this Eucalypt being easily mistaken for any other. I hope the *Agricultural Journal* will be able to publish a figure by next month. The cones of *Eucalyptus occidentalis* are bell-shaped, but drawn in at the rim and have half exserted valves, somewhat like *E. resinifera*. The cones are in bunches of about from five to ten in a bunch, and the bunches are borne on one large flat stalk. The flat stalk is decidedly flat, and often curled round like a piece of ribbon. This broad flat stalk is characteristic of several of the West Australian Eucalypts, particularly those belonging to the *Cornutæ* or *Orthostemoneæ* section. Mueller, in "Eucalyptographia" (under *E. occidentalis*), expresses the view that *E. spathulata* (Hooker) and *macranda* (Bentham in "Flora Australensis") are not separate species, but only extreme forms of *E. occidentalis*. This would leave only three good species in the *Cornutæ* group, viz., *E. cornuta* (including both the tree form and the bushy form so well known in the Cape Peninsula), *E. obcordata* (remarkable for its handsome crimson-flowered variety) and *E. occidentalis*. If this view be correct, it follows that *E. occidentalis* is one of the species of Eucalypts showing a good deal of variation, and growers of Mallet bark would have to be sure that they had got hold of not only the correct species, but the right variety.

The crimson-flowered variety of *E. obcordata*, *E. occidentalis*, *E. cornuta* (both "bushy" and "tree" forms) and *E. macrandra* can all five be seen flourishing in the Tokai arboretum, where there is a group of 40 of each of these trees.

E. macrandra, which Mueller was inclined to regard as only an extreme form of *E. occidentalis*, exhibits elongated unripe cones on hardly any stalklets with very short stamens, and smaller mature cones with very short valves. The foliage and general appearance of *E. macrandra* in the Tokai arboretum is scarcely distinguishable from that of the *E. cornuta var. symphyocarpa*.



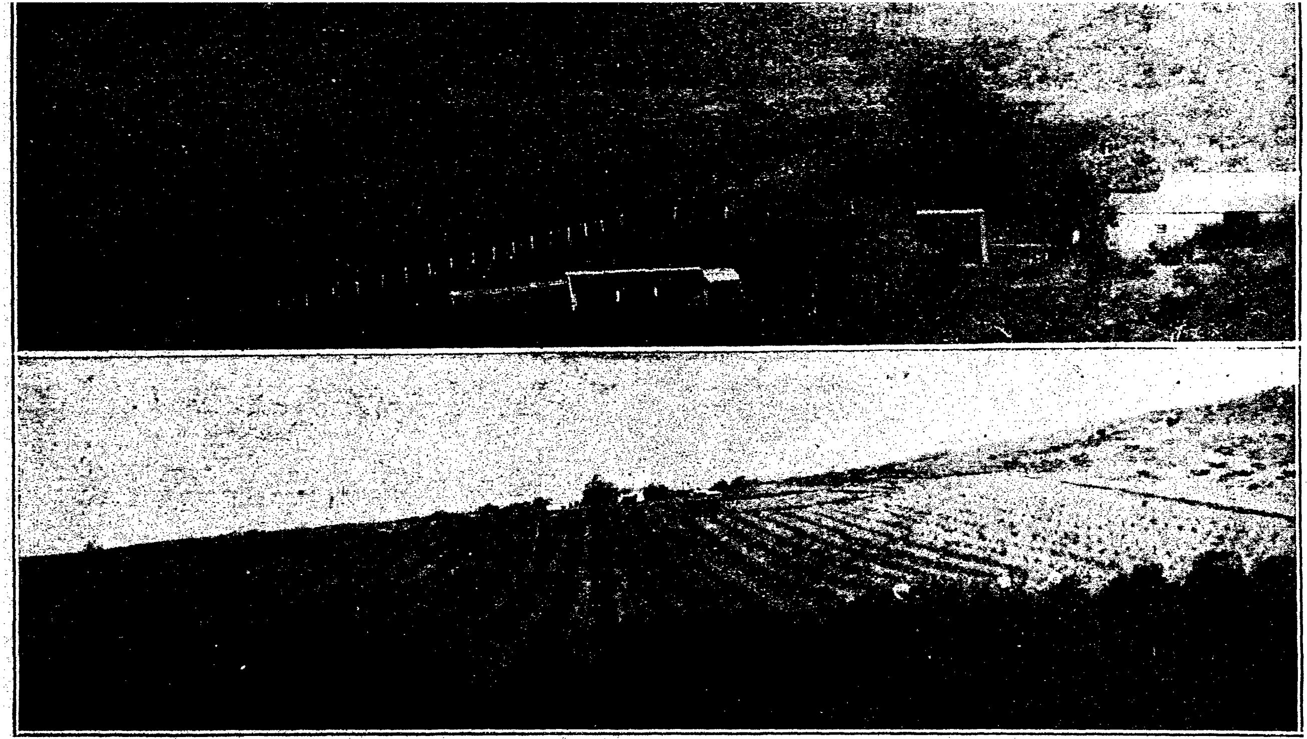
NO. XIII

IN THE DISTRICT OF ALBANY.

FRUIT GROWING FOR PROFIT.

The rapid advances which have been made in the Western Province in connection with the Fruit Industry have tended to dwarf the efforts of the Eastern farmers in their endeavours to follow suit. But, step by step, fruit culture is progressing in the Eastern Province, and, before many more seasons pass, it bids fair to rank among the more important of the farming industries of that part of the Colony. Orcharding on a wholesale scale will not suit every district in the Eastern Province, but there are very few where something could not be done in this direction while the whole of the coastal districts carry fruit of one kind or another. Lower Albany has gone ahead very rapidly of late years with the production of enormous quantities of pineapples particularly, while orchards and citrus groves on a large scale, are also being established. Neither Central nor Upper Albany have, as yet, shown so great an interest in this branch of husbandry owing, probably, to the fact that agriculture and stock rearing are still found sufficient for the energies of the majority of the farmers. Fruit, however, is bound to form an important asset in the output of this district in the future, for it is gradually being demonstrated that in spite of several natural drawbacks it is a commercial proposition that promises excellent returns.

Among the few in the immediate neighbourhood of Grahamstown itself, the capital of this part of the country, who have taken to fruit growing on a commercial scale, is the firm of J. and H. Hards. Both the partners in this venture are commercial men, but their interests are bound up in fruit as they have for years past carried on an extensive business as manufacturers of jam and preserves in Grahamstown itself. Years back they realised the necessity of providing, if possible, for a regular supply of fruit for their factory and after careful consideration decided to attempt to set an example by planting their own orchards and thus encourage others to follow in the same direction. This work was undertaken by Mr. H. Hards who, though lamentably deficient in both knowledge and experience



THE ORCHARDS AT "SUNNYSIDE.'

The upper illustration shows a view of the orchards taken from above the Homestead. The lower is a view of the orchards on the other side looking towards the Homestead.

The Orchards at "Sunnyside"
Apple Trees—"Munro's Favourite"- five years old,

when he started, has, with the assistance of his son, succeeded in establishing a range of orchards that are a credit to the district.

A great deal is often heard in the form of friendly criticism of the mistakes of experts, for it has become a favourite theory with some that the advice of experts, unless tempered by the practical experience of the man on the land, is often misleading. It is to be feared that those who are readiest with this form of criticism do not always stop to weigh the value of their words. For if ever there was a flat contradiction to this theory it is contained in the property under discussion. Mr. H. Hards frankly admits that the secret of his success was following with care the advice and instruction freely placed at his disposal by the experts of the Agricultural Department. He began as an uninformed man, without training in this class of work, and with no previous experience of farming to help him. His line was commerce pure and simple until he took this property in hand, but by dint of care and intelligence he has managed to accomplish a work of which the most experienced orchardist might be justifiably proud. He is now assisted by his son who took a course at Elsenburg Agricultural College and so far profited by it that he takes charge of the bulk of the farm work. If this can be done in the one case it should not be impossible for others to follow suit. It may not happen that everyone would succeed so well in similar circumstances, but there should be no room for doubting the issue as there is a wide margin to cover between such a success and absolute failure.

THE FARM "SUNNYSIDE."

The farm taken up by the Messrs. Hards for fruit growing is known as "Sunnyside," and is situated on the South-eastern slope of the Kowie Valley, less than three miles from Grahamstown. The Kowie Railway, which runs from Grahamstown to Port Alfred, passes the lower portion of the property, so that the question of transport can be simplified if the output becomes so great as to call for the use of a railway. The farm comprises about 1,200 acres and extends down to the banks of the Kowie River. The river does not always run as a strong stream, but there are several deep holes in it which are seldom dry and these could be utilised, with the aid of pumps, for irrigating the lower lying portion of the lands if found necessary. So far, however, irrigation has not been found necessary, as the soil, with constant cultivation, has been found to retain sufficient moisture during the dry seasons to keep the orchards vigorous and healthy. The soil varies slightly; in the upper portions it consists of fairly stiff loam, while in the lower portions by the river it is lighter and contains more sand. But it is good all through and being mostly old bush land is deep and fairly rich. This is shewn by the vigorous growth of all the trees and the fact that there have been very few failures.

The farm has been occupied by the firm for about six years and during that period about a hundred acres which carry upwards of 8,000 trees have been laid down to fruit. Another hundred acres is used for arable purposes. Altogether, including poplars for windbreaks and other varieties planted on the property, between 15,000 and 16,000 trees have been put in and the failures are scarcely worth mentioning. A very large area is still left that could be utilised for fruit, and among the schemes for future development is the planting of citrus groves to contain a couple of thousand trees. This, however, is being kept in abeyance pending experiments now being carried on and the conservation of a sufficient supply of water to obviate injury by drought. There is a good supply of water in a kloof to the East of the farm which can be dammed up at comparatively little cost. The flow there has been gauged at 15,000 gallons in the 24 hours, which, if conserved, should give a supply of great value to the property.

The growth of the trees is excellent, whichever part of the orchards one visits. Crops have been taken off for several seasons sufficient to contribute considerably towards the cost of development, and the apples and pears are now coming into bearing so that the future is full of promise and the commercial side of the venture seems as strongly assured as the cultural success. The varieties grown include several of the more popular plums which have done wonderfully well; apricots and peaches have also thrived apace; and now the apples and pears are coming on at a great rate. The brown Turkey fig has also been a success here and large crops have been harvested.

The advantages enjoyed by this property are many and the disadvantages few. With the one exception of a summer rainfall and the droughty seasons which have prevailed ever since the fruit has been put in, the troubles seem slight. The soil is deep and rich, the insect pests are few, and disease, so far, has been conspicuous by its absence. Even the fruit fly, that is a scourge in the gardens round Grahamstown, is not a serious trouble here. The apples being all on blight proof stock are free of aphis, and pear slug is unknown; while codling moth has yet to make its appearance. Being so fortunately situated, one is almost tempted to describe the place as Happy Valley. Everything seems to smile and prosper, and long may it remain so.

The secret of much of the success which has attended this proposition is undoubtedly the careful and complete cultivation which is practised. The orchards are all kept in excellent condition, the horse cultivator being constantly on the move whenever the opportunity offers. The orchards are laid out with plenty of air space and room for large implements to work. The result is eminently satisfactory and reflects the greatest credit upon all concerned. It may be mentioned that late varieties of most of the fruits have been found most suitable for this property.

THE COMMERCIAL SIDE

of the proposition is now being developed and the near future should show some very interesting figures. It was mentioned above that the Messrs. Hard carry on a large jam making business in Grahamstown and the orchards were established as an essential part of that business. Since then, however, developments have followed fast, and a scheme has been set afoot to extend the jamming and canning business and with that end in view a strong company is about to be floated to take in the whole concern. The handling of the enormous crop of pine-apples has become a serious question for these districts and this alone should form an important branch of the new concern. Apart from that, the fruit-growers are beginning to realise that they must act together if they wish to protect their interests, and to do this they must have organisation and machinery for the handling and marketing of all their crops to the best advantage. If the proposed company can succeed in bringing the various interests together and the growers support it as they should, there is great hope for the Fruit Industry in Albany and Bathurst. The conditions that make for success are there, all that is needed is organisation and business acumen to assure a thriving industry on a profitable basis.

THE KOKSTAD SHOW.

Mr. R. Pell Edmonds writes:—Having been asked to act as one of the judges at the Kokstad Show, I duly embarked on the post cart from Kei Road, and, after what I at the time considered a trying journey compensated by the lovely country we passed through, arrived at Kokstad where I found old friends to greet me in the persons of Mr. Beattie, the Editor of the Kokstad paper and Mr. Hilton Warren lately of Kei Road. Kokstad boasts only one hotel, but this is no idle expression, as the town may well feel proud of it. Everybody was there, but it was equal to the occasion and provided for everybody's comfort. The next morning I was driven to the Show-ground which is situated about a mile from the market square and commands a glorious view of the surrounding country, and entered on my task, which, owing to the number of entries, occupied me for a day and a half, and it was with a sigh of relief and an aching back from the handling of many sheep, that I awarded the last prize. I then had a look round. The first thing that struck me was:—Why had not the Editor of the *Agricultural Journal,* whom we regard as omniscient, been here to spy out the land? What I saw opened my eyes, Herefords and Shorthorns which would hold their own anywhere. The yearlings especially took my fancy as showing how cattle grow out in this country. There were also some good Frieslands, and a few Devons and Jerseys and excellent pens of cross-bred cattle. The thoroughbred horses were also a splendid display; horses bred here have made their mark on the principal race-courses of South Africa and neither money nor trouble is spared in securing the best sires, As regards sheep it has not been worth the while of the stud-breeders to expend the pains in getting them up which exhibitors in the Colony do who are on the line of railways and can go the round of the shows. Two exhibitors had lately got up some fine sheep which had been remarkably well cared for, and their weather beaten rivals stood little chance with them. It was noticeable that size of carcase and length of staple had been up to the present the principal points bred for. In the produce shed was a display which many of the larger Shows might long for in vain, a grand show of fruit notably apples and pears, bottled fruits and preserves which induced the thought that any unhappy bachelor in search of home comfort would be well advised to visit Kokstad for a few months. Butter and cheese all of first class quality, good oathay and some Japanese millet, which makes more growth than manna and has a soft and luscious stalk, and well-grown cereals amongst which was a bag of barley which equalled any sent out by English seedsmen. The produce shed is built to combine a grand stand where the ladies sheltered from the sun and wind watched the various events including the riding competitions and horse jumping for both sexes, also competitions for the best riders amongst boys and girls. There were also binding competitions and a polo match. The Show went with a swing from start to finish. The next morning I attended a committee meeting of the Agricultural Society in a marquee in the Show grounds, and was struck by the fact that the Kokstad Show is run by the farmers of the district. Complaints were heard, slight disagreements adjusted, the tact of their worthy President smoothed over little difficulties and the good spirit that prevailed was very noticeable. After the Show, I visited several farms in the neighbourhood and was much struck by the fine class of stock I saw right through, and the enormous agricultural possibilities of the district. There is no doubt that the linking of Kokstad with the various railways now approaching, will be an important factor in solving the question of food supply for South Africa.

THE AGRICULTURAL UNION OF CAPE COLONY.

EIGHTH ANNUAL CONGRESS.

First Day, Tuesday, May 2.

The Eight Annual Congress of the Agricultural Union opened its proceedings in the Town House, Cape Town, on Tuesday, May 2nd. Mr. H. W. Struben, president, took the chair.

The following were the delegates to the Meeting:—Western Province Agricultural Society: Messrs. A. Barry, P. R. Malleson and R. S. Solomon. East London: Messrs. W. Crosbie, J. Dircks and Hockly. Darling: Messrs. J. W. J. Versfeld and W. F. Versfeld. Mafeking: Messrs. E. A. Graham-Green, C.C. and R.M. and J. E. Jones. Worcester: Messrs. G. J. Hamman and C. B. Heatlie. Britstown: Messrs. P. S. Cilliers and F. C. Bayly. Robertson: Messrs. T. E. J. Brewer and D. J. de Wet. Queenstown: Messrs. G. A. Fincham and Sir John Frost. Port Elizabeth: Messrs. W. McIntosh, D. M. Brown, C. E. Geard, Josephus Winter, and the Hon. J. Pyott. Bredasdorp: Messrs. J. B. Albertyn and H. S. van Breda Pretoria: Dr. Gunning. King William's Town: Colonel Warren and Mr. Ginsberg. Sundays River Valley: Messrs. B. K. Mayo and J. Rushworth. Cradock: Messrs. J. Butler, and the Hon. P. W. Michau. Midland Agricultural Society: Messrs. G. H. Maasdorp and W. Rubidge. Cape Stud Breeders' Association: Messrs. O. E. G. Evans (Bedford), E. Hobson (Aberdeen Road) and J. Rawbone (Sir Lowry's Pass). Caledon: Dr. Viljoen and Mr. C. J. Krige. Zwart Ruggens Farmers' Association: The Hon. R. F. Hurndall and Mr. C. G. Lee. Albany Agricultural Society, Grahamstown: Mr. H. Wood and the Hon. Arthur Douglass. Richmond: Messrs. Theron and Sieberhagen. Stellenbosch: Mr. Krige.

The Hon. Secretary (Mr. Brown) submitted the following

Annual Report.

The Committee in presenting the Report to this Congress would specially refer to the duties that were laid upon them at the last Meeting, held in Cape Town. The first and most important was that of the Stud Book, and it was decided to have a Conference, representing the various States, at Bloemfontein, which was duly held in December, 1903, the Cape Colony being represented by the following members: The President of the S.A. Agricultural Union

(Mr. H. W. Struben), Mr. D. Hutcheon, C.V.S., Messrs. J. Rawbone, C. G. Lee and D. M. Brown, (Hon. Secretary of the Union); Natal, Orange River Colony, and Transvaal were also represented, and Mr. A. A. Persse (Secretary of Western Province Agricultural Society), acted as Hon. Secretary of the Conference.

The sitting lasted for three days, and the outcome was a joint committee to draw up the principles of a general stud book for South Africa, and the result of those deliberations will be found in the *Agricultural Journal* for February, 1904, or in the reprint of the same, being pamphlet No. 3, copies of which are on the table at this Conference, or may be had from the Editor of the *Agricultural Journal.* A further Conference of the Farmers of the Cape Colony was held in July, 1904, at Cradock, which was largely attended, dealing with the Stud Book, a Committee was appointed, and the Stud Book for the Association was formed. The subject was again discussed at the Inter-Colonial Conference held at Pretoria on July 25th, 1904, when Delegates from the Cape Colony on behalf of the Union were present, these being: Messrs. H. W. Struben (President,) F. D. MacDermott (Editor of the *Agricultural Journal*), G. A. Fincham, C. G. Lee, and D. M. Brown (Hon. Secretary). Your President, Mr. H. W. Struben, was called upon to preside over the meetings. At that gathering the Rules were amended and completed for the South African Stud Book Association, and a joint Committee was also appointed to arrange for an Inter-Colonial Union Conference, the first meeting of which is to be held in Pretoria. It might be further added in connection with this Conference, that many of the subjects of Inter-Colonial importance were discussed, which will be found in the Minutes of Proceedings, copies of which may be had from the Editor of the *Agricultural Journal.* Your Executive Committee cannot but look with pleasure on what might be termed the commencement of what was laid down by the Agricultural Union at their Meeting held at Johannesburg in 1895, that a Stud Book for South Africa was essential for the protection of stock in this country and the general improvement thereof.

Your Executive also note with pleasure that the extreme drought which has prevailed in the Colony, has at last broken to a very great extent, though there are districts in the Colony which are still suffering and have not yet had the benefit of rain. The drought has been one of the most severe known in the history of the Colony.

The various shows held this year have been a great success, the Western Province Agricultural Society, having, as far as exhibits are concerned, had a record, and the number of visitors from the country is one of the pleasing sights in connection with this show, as it gives them an opportunity of seeing the standard of quality of stock that is required if the country is to hold its own among the Agricultural Countries of the World. Other Towns have also had great successes and the Port Elizabeth Show this year, has, as is the case of the Western Province, exceeded all previous efforts, whilst the exhibits of machinery were such as is seldom seen in any Show-yard.

The Committee wish to place upon record their thanks to the Government for their votes last year, first, towards the Stud Book, and, second, towards monetary assistance to the Agricultural Union, and hope for a continuation of the same as being essential in the early stages for the due success of the work to be carried on.

The various subjects to be remitted to the Executive to be dealt with at the last Conference will also be duly placed before you, amongst which are the following: Titles for Show Grounds, Irrigation Bill, increased Government Grants, Experimental Farms and Agricultural Colleges, Railway Rates for Shows, Seed-testing Stations, Guano Depots, Experimental Stations, Agricultural Resources of South Africa, Labour, Official Hand-book, Officers of the Agricultural Union nominated by the Government.

The Executive also wish to place upon record the services rendered towards the Union by the Agricultural Department, and to thank more especially the Colonial Veterinary Surgeon, Dr. Hutcheon, the Government Entomologist, Mr. Lounsbury, the Agricultural Assistant, Dr. Nobbs, and Mr. MacDermott, the Editor of the *Agricultural Journal*, a production which the country has reason to be proud of by its illustrations and articles in season, dealing with matters of the utmost importance to the agriculturists of this country.

THE PRESIDENT'S ADDRESS.

The President, in moving the adoption of the Annual Report said:—"Gentlemen, I beg in moving the adoption of this Report to first thank you for having come here from long distances as Delegates from different parts of the Colony to be present at this Meeting to-day—this the Eighth Congress of the South African Agricultural Union. I know that many of you have had to sacrifice your time and private interest to the interests of the public, but I do not think if we look back at the past that we will find that any of that time has been wasted. Although we have not kept pace with other countries, yet, within the last few years, we have moved in the direction of improvements. The people are, I am glad to say, waking up to the necessity of combination and co-operation. I am glad to say that our Governments in the different states in South Africa are also recognising the necessity of furthering the interests of Agriculture as an absolute necessity to make this Country self-supporting. Everyone is aware that at the present time the Government have not a great deal of money at their disposal but they have done their best with their limited means as they have appointed several Commissions, which, doubtlessly, you have seen considerably criticised. One of these Commissions was appointed to enquire into Agricultural matters. We undoubtedly meet with opposition in matters of that kind, but I can assure you that the intentions of the Government were good. There are certain industries which cannot be neglected, however poor the country may be. I refer to matters such as Forestry, Irrigation, and the improvement of the working of the soil. These are questions which have to be gone into by the people themselves as well as by the Government. The Government can assist in giving us expert advice and also procuring that advice for us. Considerable thanks are due to the Government for the spirit and kindly manner in which they have met us in this direction. I know that of late there has been a great deal of controversy with regard to the Mines. We cannot forget that the mines of South Africa are the money producing element. We know that they distribute money and that they give work to labour and that they are the means of establishing a market for our Produce, but it must be remembered that the mines have a life and that that life after a time ceases, but Agriculture must go on. The people who live in the Country must be fed. Therefore, it is only by Agriculture that this Country can really progress and I think that any time you spend here in trying to further the interest of the Country is not time wasted. Well, gentlemen, we have a lengthy Agenda Paper before us and it will take some time to go through it. It is our intention to spend from 9·30 to 1 in considering it, and the afternoons will be devoted to amusements, Most of the Members of Parliament will have their amusement in the House (laughter). There are a very large number of questions to be dealt with but I will not go into them now. Before concluding, I should like to supplement what has been said in the Annual Report with regard to the loss which this Union has sustained by the death of Mr. Christian. There are very few men who gave their time as he did to further the interests of Agriculture, but he was prominent, not only in Agriculture but in every phase of life which concerns a citizen. The loss to Agriculture generally is one that cannot be forgotten. I again welcome you gentlemen for coming here to do the work of the Country. I formally move the adoption of the Report.

Mr. G. A. Fincham, Vice-President (Queenstown), seconded the adoption of the Report. He said he felt sure that everybody present would reciprocate in the hopes and wishes of the Chairman with regard to the future of this country.

The Chairman said that if there was no further discussion on the Report he would put the motion to the meeting that it be adopted. The motion was put and agreed to.

CHANGE OF NAME.

The first item on the Agenda was the suggestion that the name of the Union be changed.

The Chairman said that probably all delegates present were aware that at the last meeting mention was made of the fact that an Inter-Colonial Agricultural Union was about to be established, and consequently it became necessary for the different Colonies to change the names of their Unions so as to have some differentiation. It had been suggested that the name of the present Union should be "The Agricultural Union of Cape Colony," he would be glad to hear some discussion on the point.

After discussion, Mr. Cloete's motion that it be called "The Agricultural Union of Cape Colony," was put, and carried.

THE INTER-COLONIAL UNION.

The Hon. Secretary then moved: "That the 'Agricultural Union of Cape Colony' be affiliated with the Inter-Colonial Agricultural Union."

Mr. H. Cloete thought it would be advisable, before doing so, to ascertain what the proposals were and the benefits to be derived from the Inter-Colonial Agricultural Union. Personally, he knew nothing about it, and before they definitely decided to take a step of that sort the matter should be properly laid before them and thoroughly discussed. The questions which arose before his mind were:—"What are we going to do?"; "How many delegates are we going to send to their meetings?" and "What questions are going to be brought up at their meetings?"

The Hon. Secretary said that the voting at the meetings would be by States, and not by representatives, and no vote could be carried without the majority of the States voting for it. For instance, if there were five States represented, three would have to vote for a matter before it could be carried.

Mr. Krige: Then it does not make any difference whether you send two or more representatives?

The Hon. Secretary: No, none.

Dr. Gunning (Pretoria) said he did not think the Inter-Colonial Agricultural Union was an established fact yet. At a meeting held at Potchefstroom last week, it was intimated that the Transvaal Government had promised £200 towards the funds of the Inter-Colonial Agricultural Union if the other States would do the same thing, but he believed they had declined to do so. Up to the present nothing further had been done.

The Chairman: I understood that Natal had also agreed to give something.

Dr. Gunning: No, Natal has withdrawn.

Mr. H. Cloete: Under the circumstances, doesn't it seem rather premature to discuss the question? We are simply groping in the dark. It is an argumentative matter as to whether we should vote by States or not.

Dr. Gunning said he would be very sorry if this question was postponed. He thought it was of the utmost importance that there should be an Inter-Colonial Agricultural Union. There was so much work to be done that it would be impossible for delegates from each district in South Africa to attend at a meeting like the one they were at present holding. The thing they ought to do was for each State to hold a meeting and draft resolutions to be sent to the Inter-Colonial Agricultural Union, where their delegates could bring them forward. He thought it would be a pity if that meeting dispersed without a strong opinion being expressed in favour of the establishment of an Inter-Colonial Agricultural Union. He would move to that effect.

Mr. H. Cloete said that when he spoke he did not intend the matter to be dropped. He was very much in favour of such a Union as was suggested, but he considered it was rather premature to become affiliated with a Union that was not yet in existence.

Mr. MacDermott (Editor of the *Agricultural Journal*) said the position was that the Inter-Colonial Agricultural Union was established on paper, but had not got any further because arrangements had not been completed for the necessary finances, except that the various Governments had been approached. Representations had been made to the various Governments, and subsidies had been asked for. It would be a queer thing for a Government to pay money over to a central body that was not an established fact when they subsidised similar Societies in their midst. The Agricultural Union of Cape Colony received £250 per annum from the Government, and it would be better for all concerned if some arrangement could be made by which the Inter Colonial Union could be financed by the various Colonial Unions, instead of the Governments being approached direct.

Mr. G. A. Fincham (Queenstown) moved that the matter be allowed to stand over until Wednesday morning. He did so, he said, because the subject was one with which a number of members were not acquainted. If it were possible, copies of the Report of the proceedings of the Inter-Colonial Agricultural Union should be distributed amongst them; that would throw a little light on the matter. If he remembered correctly, the amount that each branch was supposed to contribute to the Inter-Colonial Union was £25 yearly.

Mr. Lee moved: "That this meeting is of opinion that we should join the Inter-Colonial Agricultural Union, but that a sub-committee of three should be appointed to consider the question in all its bearings, and to report to the Congress on Thursday morning; the consideration of such report to have precedence."

This was carried.

The following gentlemen were appointed as the Committee:—The Hon. A. Douglass, Mr. G. A. Fincham, Mr. C. G. Lee, and Dr. Gunning to be in attendance.

MACHINERY PRIZES AT AGRICULTURAL SHOWS.

Mr. Hockly (East London) said this matter was brought before the East London Society at the instigation of the merchants. They gave their reasons for suggesting that the practice of giving prizes should be abandoned. As a result of that, the East London Society had decided not to give any prizes for machinery and the King William's Town Society worked with them in this respect. So that, had the shows been held this year there would have been no prizes given for machinery, and he knew they would have the largest exhibition they had ever had of machinery. He simply made that explanation as they were the principal movers in the matter.

Mr. R. S. Solomon (Cape Town) said he did not quite understand the question on the agenda paper. He would like to know whether it was intended to give up all the prizes or not. His own idea was that there should be a prize for the best collection of machinery. The individual prizes for ploughs and harrows could be done away with. It was impossible for Judges to decide which was the best plough or best harrow by simply looking at it, whilst it would be quite easy to say which was the best collection of machinery. He would not advocate giving prizes for machinery in motion, such as Oil Engines and Oil Motors. The implement men went to greater expense than the stock owners did for these implements.

Mr. P. Ryan (Cape Town) thought that the matter could be safely left with each individual society to do as they thought best. He did not think it was their duty to dictate to them as to what they were to do. He thought it was rather an impossible job for any man to say which implement was the best. He believed that when the farmer got the implement into his hands he very soon knew which was the best make without being told by a judge at the show. He had known in many instances instruments that had received first prizes at shows work out in two or three years, whilst those that had been passed over by the judges were now taking their places. He moved that they pass on to the next item on the agenda paper.

Mr. Ginsberg, M L A. (King William's Town), said that after their experience at East London they did not want to see prizes given for machinery. He thought it necessary that that question should be decided at once. If, next year, King William's Town gave a prize for agricultural machinery it would make a big difference to the East London Show. He did not think it was necessary to give prizes for agricultural machinery as the merchants were only too glad to exhibit it at shows.

Mr. Albertyn (Bredasdorp) said that he fully agreed with what Mr. Ryan had said. He thought the matter should be left to the different societies to decide whether they would give prizes or not. He would second Mr. Ryan's proposition.

Mr. Wood, M.L.A. (Albany) said that as representing one of the oldest Agricultural Societies he would support Mr. Ryan. The fine exhibition they had of machinery at Grahamstown had done a lot to bring the show up to what it now was. If they deprived it of the machinery class they were deprived of a big entry. Just as they gave prizes for imported stock, why not give prizes for machinery. It they could carry out their show so successfully in giving prizes for machinery why should they be compelled to stop it now.

Mr Geard (Port Elizabeth) endorsed all Mr. Ryan had said and added that his Society encouraged the exhibition of machinery.

Mr. G. A. Fincham (Queenstown) moved the following resolution:—

"That in the opinion of the Agricultural Union of Cape Colony it would not be to the best interests of the Colony to discontinue the giving of prizes for machinery." It seemed to him to be almost a farce to attempt to discontinue the exhibition of machinery. He had tried to find out what was behind it, but all he could find out was that it was a very expensive thing for merchants to move implements from one show to another. It was absolutely essential to South Africa in her present state that they should have large exhibits of machinery at their shows. He would be very sorry if they passed any resolution to discontinue such exhibitions.

Mr. Fincham's amendment was lost and Mr. Ryan's motion was then put and carried.

LISTS OF JUDGES.

The next matter considered was the following notice on the Agenda:—"That the various Agricultural Societies throughout the Colony should send to the Executive the names of competent judges in the various classes for use by the various Societies, and that a list should be kept of those qualified in their respective classes."

The Hon. Secretary said that this notice came from Port Elizabeth. Great difficulty was experienced in getting judges, and although they had lists of them made up years ago, nothing had been been done with them. The various classes in sheep and goats brought out such good animals that men shirked the duties of judge. He had very little doubt but that it would be a great help to the Society to have the names of competent judges whose services they could avail themselves of. He moved the resolution as above. The resolution was put to the meeting and carried.

UNIFORM WEIGHTS AND MEASURES.

A discussion arose as to the advisability of establishing a uniform standard for weights and measures throughout South Africa.

The Hon. Secretary said that the system of weights and measures was not the same in the Transvaal as it was in the Cape Colony. The idea of the resolution was to get the various Governments to arrive at a uniform system.

Dr. Gunning enquired if the suggestion was that the Metric System be adopted throughout South Africa

The Hon. Secretary said that matter would have to be settled by the Government.

Dr. Gunning said that if the Metric System was to be adopted he would certainly support the motion.

Mr. H. Cloete, M.L.A., said he presumed that the difference came in in the selling of articles. The question of the Metric System had been mentioned in Parliament. They knew that the States were trying to get it introduced, but the difficulty was that they could not get the Imperial Government to adopt it, and the result was that all the invoices for goods imported from great Britain, would come out here in one system and would have to be changed, into the other. That would be a serious thing for big importers.

Dr. Gunning said that if there was general expression of opinion on the subject, they might be able to get the Mother Country to alter it.

The Chairman said that there was no doubt but that it would be greatly in the interests of humanity if the system of weights and measures were the same throughout the whole world. It certainly was to their interest to have a universal system in the Colonies. It was, however, hardly worth while discussing the matter at that stage. The matter could be considered at a later stage.

EXEMPTION OF AGRICULTURAL SOCIETIES FROM RATES.

The next matter dealt with was a motion to urge upon the Government to add a clause to the Agricultural Bill to exclude Agricultural Societies from Municipal Rates and Water Rates. (Water to be paid for according to quantity consumed).

The Hon. Secretary said that last year a resolution to that effect was carried and they now wanted it confirmed. In Port Elizabeth the value of their property was about £14,000, that was for buildings alone; and when one came to consider the municipal rates and the water rates they had to pay on that valuation it became a big item. Churches and Hospitals were not asked to pay these rates, and as Agricultural Shows were for the good of the country he did not see why they could not be exempt.

Colonel Warren, M.L.A. (King William's Town), said he thought it should be made plain that the exemption should only apply to buildings used exclusively for agricultural purposes. He did not think that, if used for other purposes, the Societies should be exempt from taxes; for instance, during Martial Law the Military took possession of their grounds, and used the different sheds as storage rooms; it was only fair that they should pay taxes for them.

Dr. Viljoen, M.L.A. (Caledon) moved as an amendment: "That this Congress urges upon the Government the necessity of introducing a Bill to exclude all Agricultural Societies' properties from municipal and other rates and taxes (except for the amount of water consumed)." He did this, he said, because there was a great doubt in another place as to whether the Agricultural Bill would ever see the light again, and they did not want to waste the time waiting until the Government should arrange to bring in another Agricultural Bill.

The Hon. Secretary, on behalf of Port Elizabeth, accepted the the amendment. Mr. Van Breda (Bredàsdorp) seconded the amendment.

Mr. Krige (Stellenbosch) said they should remember that the municipal rates in the different towns were a very heavy tax, and that the farther they extended the lighter they would be. Stellenbosch paid more to the Divisional Council than the whole of the district. Their Agricultural Society had received a large tract of land from the Municipality for nothing, and if they adopted Dr. Viljoen's motion that Society would be exempted from paying any taxes. Supposing the Society made profit out of their show, it was not fair but that they should contribute something towards the maintenance of their towns. If Dr. Viljoen would alter his amendment to read "that they be exempted from all Divisional Council rates," he would have great pleasure in supporting it.

The Chairman said that the Agricultural Societies were not run as profit-making concerns; they were run to educate the people. All the money derived from them was spent in the interests of the country, and therefore it was quite reasonable under the circumtances to expect that they should be exempted from taxation.

Mr. Ryan (Cape Town) said that this was a subject that they of the Western Province Agricultural Society had had before them on more than one occasion, because they considered that they had a very good case for exemption. It appeared to him that as the principal work of the shows was to educate the people, and as they were institutions purely supported by the public and in receipt of grants from the Government, they should be exempted just the same as hospitals and churches were. If Agricultural Shows were not educational institutions, he did not know what was. He cordially supported the motion so ably moved by Dr. Viljoen.

Mr. Ginsberg, M.L.A. (King William's Town), said that many Show Societies had regular incomes from letting their grounds for purposes other than for shows, and he certainly thought they should not be exempted. Of course, he saw nothing wrong in a Society letting its place, if by doing so it could keep out of debt. As far as Societies were concerned that did not let their grounds for other purposes, he certainly thought they should be exempted. As Mayor of King William's Town, he knew that the King William's Town Council rates would suffer if such a measure were introduced, but he felt that it was only right that Societies which were doing good work in the country should receive every support possible.

The Chairman then put Dr. Viljoen's amendment, which was unanimously carried.

ADMISSION OF FARMERS' ASSOCIATIONS.

The Hon. Secretary said the Executive had been asked to consider the advisability of admitting farmers' associations to Membership of the Union, subject to political discussions being barred. They had done so and were in favour of it, but of course nothing could be done without consent of the Union, so that if the Union wanted to carry out the wishes of the Executive they would consent to the admission of farmers' associations. He would therefore move that farmers' associations be admitted to membership of the Union, subject to political discussion being barred. The motion was put and carried unanimously.

ADMISSION OF POULTRY CLUBS.

The Hon. Secretary said that the advisability of admitting poultry clubs to the Union, was not submitted to the Executive, but as an application had been received from a poultry club to be admitted he had placed the matter on the Agenda for consideration.

Mr. Fincham (Queenstown) said he would like any gentleman present who was interested in poultry clubs to give his reason for their inclusion. He feared that unless the Union minded itself it would be apt to spread too wide. He had no objection to poultry clubs being admitted, but he would like to have a small explanation as to their status before anything is done.

Dr. Gunning (Pretoria) said the Transvaal Union had applications from poultry clubs to be admitted, and they admitted them.

Mr. Fincham (Queenstown) said he would move as an amendment that the matter be referred to the Executive for enquiry, and that they report to the Union at the next Congress, as to what way it might affect them. As an Agricultural Union, he honestly believed that they were going a bit too fast in deciding at once to admit poultry clubs. He thought it would be better for them to go a little slowly.

The Chairman said that before he did anything he would like to know how these poultry clubs were constituted. He was not against the principle of their joining the Union, but he thought it was not wise to rush into the matter without being fully acquainted with the facts. He would like to be furnished with details as to their constitution, how long they had been established and, as there was no hurry, he was in favour of leaving the matter over for twelve months.

Discussion continued at some length and it was ultimately decided to adopt the following Amendment moved by Mr. H. Cloete, M.L.A.

"That this Meeting is of opinion that it is desirable to admit Poultry Clubs to the Union, and the question of the representation and the terms of their admission shall be left in the hands of the Executive."

THE STUD BOOK.

Mr. C. G. Lee said he had no doubt that all the Delegates were fairly well acquainted with what steps had already been taken with reference to the formation of a Stud Book in the Cape Colony. As far as this Colony was concerned, a stud book had been formed and up to the present over 400 entries had been made, and over 100 members had joined. The Government had come forward in such a manner as to give them great encouragement. It might be that there were matters to be dealt with with which they were not acquainted, but they were not aware of any. As far as he could see, the Government had given them every support they had asked for, and he could only ask the Government to continue that support. If by any means they happened to withdraw their material support, the subject would fall to the ground. It seemed to him it should be the object of the breeders of different stock to do their best to make this Stud Book a success, but at present they were unable to do so without Government support. It was decreed in the Rules and Articles that stock should be examined on the farms of owners. The farmer had to pay for that himself and in addition to that there were the subscriptions and the entry fees, which of course would in time add materially to the revenue. He would move a resolution asking the Government to continue their present support and to help the Stud Book in every way possible.

Mr. Hobson seconded the motion, which was carried unanimously.

INTER-COLONIAL SCAB ACT.

The Hon. Secretary said that the advisability of having an Inter-Colonial Scab Act was discussed at the last Meeting of the Transvaal Agricultural Union, and the matter was placed on the Agenda for the present Meeting, so that, if possible, they could carry a resolution asking their Government to consult with the Governments of the different Colonies on the advisability of having an Inter-Colonial Scab Act.

Mr. Butler (Cradock) said he really thought there was no use in wasting the time of the Congress in dealing with this matter, until they knew the best course to be adopted. He heard the matter discussed at Bloemfontein and he thought it would be satisfactorily settled if they passed a resolution affirming what had been done there.

Mr. Fincham (Queenstown) said everyone in the Colony knew the great necessity for having an Inter-Colonial Scab Act, and it was for the different Governments to arrange it. If they adopted a resolution stating the necessity for such an act, he thought they would be doing all they could. To go over the whole matter would only be a waste of time. Until there was something definite before them, they could do nothing.

He moved the following resolution :—"That this Congress urges the necessity for a uniform Inter-Colonial Scab Act, and that Copies of this resolution be sent to the Government."

Mr. Geard (Port Elizabeth) seconded Mr. Fincham's motion, which was unanimously carried.

REMOVAL OF STOCK.

Congress proceeded to discuss the advisability of a uniform system of Permits for the removal of stock throughout South Africa.

Mr. Hutcheon, C.V.S., said he thought there was great necessity at the present time for a uniform system of Permits for the removal of stock. There was at present a likelihood of the legislation of the new colonies being changed, and they were likely to get ahead of them, but still a great deal could be done if some really representative body could take the matter up and have it discussed at the next meeting of the Inter-Colonial Agricultural Union. He did not know if it was possible to discuss the matter in detail there. They would probably require to have considerably more information than was at hand. It was absolutely necessary that they should do something to facilitate the removal of stock from one colony to the other.

Several delegates expressed a wish to hear Mr. Davison's opinion on the matter.

Mr. Davison (Chief Inspector of Sheep) said he could only point out that there was a great difference in the regulations that at present existed in the different colonies, and he thought that the sooner they could be amalgamated the better, as it would facilitate business greatly.

Mr. Hutcheon said there were a great number of regulations with regard to the introduction of stock from one colony to another at present in force, and he thought it was necessary that something definite should be placed before the Congress to act upon. He thought a Committee should be appointed to go into the subject and draft some regulations that it would be advisable to have adopted. They wanted something to place before the other colonies to show what it would be advisable to do. This matter was of great importance and it would take some time to consider it. He would propose that the Executive be empowered to draw up a report to be submitted to the Congress for action. This was adopted.

THE FENCING ACT.

Mr. Rubidge, M.L.A., said the matter of asking Parliament to pass an act defining what a proper fence was, had only recently dawned upon them and it was one of the most important subjects that could possibly have been brought before the Congress from the country generally. From his experience of the Agricultural Commission, the evidence there clearly shewed that the only way to restore this unfortunate country's industry was a proper system of fencing. They had been going on for the past 30 years attempting to wipe out the vermin at tremendous expense, but he regretted to say that their efforts had not been at all successful. They could go on with the same methods for the next 100 years but he would not like to try and give a forecast of what the country would then be like. He had been farming for the last 40 years and he had suffered from nearly every plague known to the farming community, but he thought that the worst plague the farmers of this country had to face was vermin, and he thought the only way to effectually wipe that plague out was by a proper system of fencing. If they fenced their farms they were going to increase their flocks, they were going to better their land, and they were going to better the status of the pastoral industry of this country. He was introducing a bill into Parliament during the present session, with regard to a system of fencing. His idea was to amend the fencing act, and he wanted the

Government to define what a fence was. Of course, if his bill became law he hoped that the Government would bear its fair share of the cost of the erection of the fence. He had approached the Ministry on the subject, and he believed they were perfectly willing to meet him. He however, felt his hands would be greatly strengthened if he could get the Congress to support him with the resolution.

The Chairman said he would like to tell the Congress exactly what was done in the newly constituted Colony of the Transvaal. There, tick fever came in from Rhodesia and from German East Africa. This disease was devastating the country. He had a letter in his possession telling him that the whole of the farms that had been fenced on the £ for £ principle were perfectly clear from the disease. He held that farming could not be carried on properly in this country without fencing. Not only vermin but diseased stock roamed for miles and miles and infected the cattle on farms which were not properly fenced in. He regretted to say that the plague of vermin, instead of diminishing, was growing yearly. Of course, the farmers themselves could do nothing unless the men who represented them in Parliament were prepared to take the matter up. He went much further than most men were prepared to go. He knew that in countries like this they had to have a proper Fencing Act applicable to the whole colony, the clauses of which should be compulsory. Until the people were bound to fence their farms, this country would not be able to hold its own against others.

Mr. Evans said great loss was sustained on ostrich farms through the want of proper fencing.

The Chairman inquired if, under the present Act, steps were not taken to enforce compulsory fencing in certain parts of the colony.

Mr. Rubidge said that under the Bill he was now introducing, he was merely asking the Government to define a vermin-proof fence, and in defining that it was only to be recognised as between one farmer and another. The existing act stipulated that two farmers should agree as to the fence that was to be put up. His experience was that the ordinary fence at present in use was very much out of date. The Government were prepared to make advances of money to farmers to enable them to erect these fences. The Bill that he was introducing did not leave it optional with one farmer to say "Oh! I'm not going to pay half the cost of a vermin-proof fence." Of course this Bill would only be enforced in districts where the present Act was in force. He had not the slightest doubt but that, in the near future, when the other districts saw the great benefits that accrued from the working of the new Act, they would gladly adopt its regulations. He presumed there was not much good in his telling a meeting composed of farmers of the results that ensued on farms where fencing had been adopted. At the present time he had a farm of 5,500 morgen, and he could keep 2,500 head of stock on it. For these 2,500 head of stock he had to keep three herds and an overseer. Now if he had this fenced he could add a third more to his flocks because he could let them run both day and night and he could also do away with his herds. Now in order to make his farm vermin proof, it would cost him about £600 but he would be able to save at least £200 a year by dispensing with the services of his herds, and he would find that in two years' time he would have saved the price of his fence because the Government would have paid half the expense.

Mr. Fincham said the subject as it was brought before the Union was rather indefinite. They were asking the Government to define a vermin-proof fence; was it not defined in the Act? He thought the only course open to the Union was to bring forward a resolution, asking the Government to support this Bill.

Mr. Rubidge said the Bill had been published and one of the clauses defined the fence and as to how it was to be contructed. He understood that at the present time a good vermin proof fence could be obtained for 8½d. per yard.

Mr. Fincham said he understood from what Mr. Rubidge had said that he wanted that Union to pass a resolution in support of the Bill which he was introducing into Parliament. He would like to point out that even if they did pass such a resolution it could not be taken as being in support of the Bill, because they had nothing definite before them. All Mr. Rubidge could do would be to tell Parliament that at the Agricultural Union a resolution was adopted, advising the Government to define what a proper fence was.

Mr. Rubidge said all he really wanted was a resolution asking the Government to define what the fence should be.

The Chairman said that Mr. Rubidge's Bill only asked the Government to define a vermin-proof fence in those districts in which the present Act was enforced. He was hoping that some member would propose that the whole fencing act of the country should be taken into consideration.

Mr. Van Breda (Bredasdorp) said he did not quite understand the drift of the argument. From what he could understand, Mr. Rubidge was asking the Union to adopt a resolution dealing with the Bill with which very few of them were acquainted. Therefore, he thought the best way to overcome the difficulty would be to appoint a Committee to go into this Bill in detail and bring up a report before them. Therefore, he would propose the following resolution:—"That a Committee be appointed for the express purpose of going into Mr. Rubidge's Bill and to report to the Congress whatever necessary clauses or amendments may be considered advisable."

Mr. Rubidge said that the amended clause that he had put in defining this fence was adopted by the Farmers' Congress in March last. He had been advised on no account to take away the permissive clause in the present Act, because if he did so it would not pass. The moment be brought in anything too drastic, the whole Bill would fall to the ground.

Mr. Starke enquired if it would be left to each district to say whether they wanted a vermin-proof fence or not. There might be districts where the order might not be required, and then there were districts in which it would be impossible to erect vermin-proof fences For instance, he could not erect them on his farm.

Mr. Rubidge moved the following resolution :— " This Union in Congress affirms that it is very necessary to introduce legislation making it necessary for farmers and others to fence their farms with such fencing as is required. "

Mr. Hobson said that at the Farmers' Associations, they had gone very carefully into this matter and they had found that many difficulties faced them. For instance, they were unable to find out the cost of fences. Mr. Rubidge had obtained for his Bill the support of the Farmers' Congress which sat at Somerset East in March last. There it was defined what a vermin-proof fence constituted. It constituted a certain mesh and a certain wire, which were stipulated in the Bill. The fact of the matter was, Mr. Rubidge's Bill was in reality an amendment of the existing Act. This Amended Act would not stand for the whole colony. Under Mr. Rubidge's Bill it was left to the farmers to ask to have a certain district proclaimed. It was not likely, in fact great difficulty would be experienced, to get the farmers to sign asking to have a certain area proclaimed. He took it that wherever farmers shewed sufficient necessity for the fencing act, the amended Act would be immediately put in force. He was in hearty sympathy with the Bill which Mr. Rubidge was introducing. For many years past he had used every endeavour to bring before the notice of the public the great danger which this country had before it, with regard to the deterioration of their flocks and the veld, and so great was it that he wanted to impress it again. The salvation of the country lay in protecting the veld. He hoped the meeting would go no further but would heartily support Mr. Rubidge's motion.

Mr. Heatlie said that he did not think this fencing act was required in every district. It was not fair to ask farmers who were going in entirely for agriculture to erect vermin proof fences, nor were they necessary in cattle breeding districts.'

The Hon. A. Douglass said he thought it was necessary to move with very great care in this matter. They said the fencing act required amending; of course, fencing was the saving of the country and during the last few years they had quadrupled the amount of land that had been fenced in the Colony. Mr. Rubidge's Bill provided for barbed wire fences. He would be totally opposed to anyone compelling him to put barbed wire on his fences. He was farming with ostriches, and that killed ostriches more than any thing else. His neighbour who went in for sheep farming might want to put up a barbed wire fence, which would be much to the detriment of his ostriches. He would move that the matter be adjourned until the following morning.

The Congress then adjourned until the next morning.

MANURIAL EXPERIMENTS WITH CEREALS, 1904.

By Dr. Eric A. Nobbs.

The following statement of results of certain manurial experiments conducted in various parts of the Colony in co-operation with the Department may appropriately be made public, at the present sowing time.

While mainly intended to give information to the particular farmers concerned, the figures should prove of interest to all grain growers, as showing them how to find out for themselves what is the best manure to use, and what quantities are necessary. It is in this way that farmers in other countries have slowly learnt during the last fifty or more years, lessons which have revolutionised their practice, and confirmed them by manifold repetitions, until now the questions of the amount of fertilisers to use, what kinds to select, and when and how to apply them, have become common knowledge, generally admitted and acted upon. We, in the Cape Colony, are only at the commencement of finding out these facts, and are still very much in the dark on many elementary points. Tedious and laborious as is the method of experiment, yet it is the surest way to arrive at reliable conclusions on these matters, which are of such vital importance to our agriculture.

The Quantity to Use.

This is a very vexed question, and of course varies from place to place with the character of the soil. The results here published can only be taken as a guide for farms known to be similar to those mentioned, but it is hoped that by describing the experiments, others may be induced to try them on their own farms, in which case the writer will be happy to assist them in every way, and to supply the necessary fertilisers, ready weighed out, free of charge at their nearest railway stations.

In considering the figures, it should be remembered that the relative differences on any one farm only, must be examined, where the conditions were identical throughout, and one farm should not be compared with another, as at the different places the crops were weighed at different stages of ripeness and dryness, some on the day of harvesting, others a long time after. The fact that on some farms the crops appear to be twice as heavy as on others does not, therefore, imply that such places are double the value.

The "akker" used in ploughing varies on almost every farm, and runs from 10 to 16 yards wide as a rule, and from two to three hundred yards long. It is therefore no guide to say how much manure is used on an "akker". The custom of the country is to apply artificial manure in quantities proportional to the amount of seed sown. As this varies very much from place to place, and is altogether an empiric guide, it has been considered desirable to experiment on plots of equal size, and to express the results in pounds per acre (4,840 square yards). This gives us a simple standard, and any farmer can easily estimate for himself what quantity of seed he sows on that area, and hence apply the experimental results to his own case.

The trials were made both in Government Guano, and in a proprietary "complete fertiliser" (Odams'), the former being slightly heavier because equivalent money values were taken, and guano being the cheaper, more could be used per acre. But as also 300 lbs. of each per acre was applied, these two columns may be compared as showing the effect of equal weights of these fertilisers.

In the accompanying tables is given the weight of oathay per acre resulting from the application of the quantities of fertilisers stated. This is followed by the nett inçrease in weight over a "control" plot, which received no fertiliser. The percentage increase is then indicated, so that the effect of different applications may be compared. It must not be assumed that the heaviest manuring always gives the biggest crop. There is a point above which a fertiliser may be positively injurious to the crop, thus, in two cases out of six under review, 300 lbs. of "complete fertiliser" gave actually lighter crops than an application of 250 lbs. while on another two farms, the maximum "dose" of guano also gave smaller crops than a lighter dressing. But even where the actual crop is heavier, the increase may not be sufficient to justify the extra fertiliser used, not being more than the equivalent of the price. Thus at Koekjespan, Malmesbury, the use of 240 lbs. of guano costing 15s. 7d, added 1,300 lbs. to the crop of oathay, which at 3s. 0d. per 100 lbs. would be worth £1 19s. 0d, thus giving as a direct profit on the use of the fertiliser, £1 3s. 5d. If 300 lbs. of guano are applied, 1,460 lbs. of oathay more than if no manure were used, is harvested, thus the extra 60 lbs of guano costing 3s. 11d gives an additional 160 lbs. of oathay, worth at the above rate, 4s. 10d. The use of this extra application is therefore only rewarded with a profit of 1s. 1d. With a further increase of 60 lbs. of guano, an extra 100 lbs of oathay results, therefore for this last outlay of 3s. 11d. only 3s. 3½d is obtained, so that an actual loss resulted. For further particulars the reader is referred to the tables themselves.

COMPLETE FERTILISER AND GUANO TRIALS

Manures and Crops Shown in pounds per Acre.

Farm	Manure	200 lbs Complete Fertiliser	240 lbs. Guano.	250 lbs. Complete Fertiliser	300 lbs. Guano	300 lbs. Complete Fertiliser	360 lbs. Guano.
	Value ..	16s 0d	15s. 7d.	£1	19s 6d	£1 4s.	£1 3s. 5d.
Waylands. (Unmanured plot, 1,240 lbs.)	Actual Yield ..	1,480	2,360	1,960	2 210	1,810	2,450
	Increased Yield ..	240	1,120	720	970	570	1,210
	Percentage Increase	19·4	90·3	58 1	78·2	45·9	97·6
Alexanderfontein. (Unmanured plot, 3,100 lbs.)	Actual Yield ..	3,410	4,030	3,580	4,230	4,150	3,870
	Increased Yield ..	310	930	480	1,130	1,060	770
	Percentage Increase	10·0	30·0	15 5	36·5	33·9	24·8
Slangkop. (Unmanured plot, 400 lbs.)	Actual Yield ..	620	740	600	820	790	940
	Increased Yield ..	220	340	200	420	390	540
	Percentage Increase	55·0	85 0	50·0	105.0	97 5	135·0
Koekjespan. (Unmanured plot, 780 lbs.)	Actual Yield ..	1,930	2,080	1,760	2,240	1,750	2,550
	Increased Yield ..	1,150	1,300	980	1,460	970	1,770
	Percentage Increase	147·4	166·7	125·6	187·2	124·4	226·9
Dunghye Park. (Unmanured plot, 2,025 lbs.)	Actual Yield	2,725	3,140	2,995	4 015	3,665	3,985
	Increased Yield	700	1,115	970	1,990	1,640	1,960
	Percentage Increase	34 6	55 1	47·9	98·3	81·0	96 8
Modderfontein. (Unmanured plot, 225 lbs)	Actual Yield	862 5	1442·5	740	1,565	1202·5	1,635
	Increased Yield	567·5	1147·5	445	1,270	907·5	1,340
	Percentage Increase	193·4	389·0	150·8	430·5	307·6	454·2

At Uitkyk in the Paardeberg area of Malmesbury, a trial similar to those above described, but with Wheat, was carried out, and is tabulated below. The results are somewhat marred by the fact that it was impossible to thresh and weigh the grain from each plot separately. Guano certainly tends to stimulate the growth of straw and leaf, the heaviest crop therefore is not necessarily the most remunerative, and the plot receiving 300 lbs. of guano seems unduly light, while the one next to it, unfortunately, was partially influenced by an adjacent "heuveltje". Such accidents cannot well be avoided, but must be borne in mind in studying the results.

MANURES AND CROPS SHOWN IN POUNDS PER ACRE.

Farm.	Manure.	200 lbs. Complete Fertiliser.	240 lbs Guano.	250 lbs. Complete Fertiliser.	300 lbs. Guano.	300 lbs. Complete Fertiliser.	360 lbs. Guano.
	Value ..	16s.	15s. 7d.	£1.	19s. 6d.	£1 4s.	£1 3s. 5d.
Uitkyk. (Unmanured plot, 1,520 lbs.)	Actual Yield	3,460	6,060	3,750	3,860	4,030	6,010
	Increased Yield ..	1,940	4,540	2,230	2,340	3,510	4,490
	Percentage Increase..	127·6	298·7	146·7	153 9	230 9	295·1

At Dunghye Park, Caledon, a more extended trial of guano was made, the results of which are given below. Here, 200 lbs. of guano appears to give the best results, while an additional 50 lbs. is distinctly hurtful, and a further 50 lbs. so far burns up the crop that the result is no better than when only 100 lbs. was used.

MANURE AND CROPS SHOWN IN POUNDS PER ACRE.

Manure Applied	No Manure.	66 lbs. Guano.	100 lbs. Guano.	150 lbs. Guano.	200 lbs. Guano.	250 lbs. Guano.	300 lbs. Guano.
Actual Yield ..	2,025	2,875	3,445	3,965	4,250	4,140	3,845
Increased Yield	..	850	1,420	1,910	2,225	2,115	1,820
Percentage Yield ..	..	41·9	70 1	95·8	109·9	104·7	89·9
Value of Increased yield at 3/- per 100 lbs. ..	..	£1 5s. 6d.	£2 2s 7d.	£2 18s. 2d	£3 6s. 9d.	£3 3s. 5d.	£2 14s. 7d.
Cost of Manure	..	4s. 3½d.	3s. 6d.	9s 9d.	13s. 0d.	16s. 3d.	19s. 6d.
Nett Profit per Acre ..	..	£1 1s. 2½d.	£1 16s. 1d.	£2 8s. 5d.	£2 13s 9d.	£2 6s. 2d.	£1 15s. 1d.

THE BEST FORM OF PHOSPHATIC MANURES.

On certain farms where experiments had been conducted in the previous year, it was considered desirable to still further test the relative values of different forms of phosphatic manures. This is essentially one of those simple experiments which every farmer can and ought to try for himself, as the best kind of fertiliser depends entirely on the nature of the soil, which varies from farm to farm, and even on the same farm. Not all the various phosphatic manures were tried in every case, since certain ones had already shown their unsuitability on the farms in question.

The position of dissolved bones in the lists is noteworthy. Wherever tried, it has proved the best, though it must be pointed out that in order to supply equal quantities of phosphoric acid considerably more of dissolved bones had to be used than of high grade superphosphates or of basic slag. But on the other hand since dissolved bones themselves contain a considerable amount of nitrogen, correspondingly less nitrate was applied. In every case ample nitrogenous and potash manure was added so that the test was purely one of the form of phosphates, in soils otherwise amply supplied with all the essential plant foods.

CROPS SHOWN IN POUNDS PER ACRE

Farm.	Manure applied	High Grade Superphosphates, Nitrate of Soda and Potash	Dissolved Bones, Nitrate of Soda, and Potash	Low Grade Superphosphates, Nitrate of Soda, and Potash	Basic Slag, Nitrate of Soda, and Potash.	Basic Superphosphates, Nitrate of Soda, and Potash
Dunghye Park (Unmanured Plot, 2,025 lbs.) OATS	Actual Yield ..	2,990	3,476	2,775	3,035	
	Increased Yield ..	965	1,445	750	1,010	
	Percentage Increase	32·3	41·6	27·0	33·3	
Alexandersfontein. (Unmanured Plot, 2,980 lbs.) OATS.	Actual Yield .	3,500	4,070		3,580	
	Increased Yield..	520	1,090		600	
	Percentage Increase	17·4	36·8		20·1	
Waylands. (Unmanured Plot, 1,200 lbs). OATS.	Actual Yield ..	1,940	1,960			
	Increased Yield..	740	760			
	Percentage Increase..	61·7	63·3			
					Basic Superphosphates.	
					200 lbs	300 lbs.
Uitkyk. (Unmanured Plot, 1,520 lbs) WHEAT.	Actual Yield ..				4,430	6,430
	Increased Yield ..				2,910	4,910
	Percentage Increase ..				191·4	323·0

The Value of Nitrogen

The use of nitrate of soda to encourage the vigorous growth of leaf in forage, has not yet received that attention which it deserves. guano and all artificial complete fertilisers contain nitrogen in some form. This is the most costly element of plant food, and is also the one most easily lost by drainage. To measure the benefit derived from the use of nitrogen some simple experiments were conducted at Elsenburg last season. The results are instructive and speak for themselves. Each plot received a full manuring, but nitrate of soda was used in addition.

Manure and Crops shown in pounds per Acre.

ELSENBURG.—WHEAT

Plot.	Manure.	Actual Yield.	Increased Yield.	Percentage Increase.
1.	Nil	1,175	..	..
2.	Top dressing 50 lbs. Nitrate of Soda	1,235	60	4·8
3.	Do. 100 lbs.	1,750	575	46·6
4.	Nil	662	..	..
5.	Top dressing 50 lbs. Nitrate of Soda	776	114	17·3
6.	Do 100 lbs.	1,263	601	90·7

The nitrate of soda used was kindly supplied by the De Beers Explosive Works under the name of "recovered nitrates," and as it runs to about 95 of pure nitrate of soda, it is an effective fertiliser, especially suited for forcing on the growth of backward crops, and for green barley, oathay and the like. It may confidently be recommended for use if obtainable at reasonable price. As will be seen from the table, the use of 100 lbs. at Elsenburg, gave an increased return of oathay worth at 3s. 0d. per 100 lbs., 18s. 0d. per acre.

Top Dressing.

It is important to know whether to sow nitrate of soda, which is very readily washed out of the soil, either along with the other manures at seed time, or as a top dressing towards the end of the rainy season, when with increasing warmth, growth recommences. For this purpose two plots on various farms were treated identically, and liberally manured, except that to the one plot nitrate of soda was applied with the seed, whereas it was not applied to the other until the month of October. The weight of the evidence as will be seen from the subjoined table is in favour of applying the nitrate of soda as a top-dressing on the growing crop though in a couple of instances, the reverse has proved the better practice. It is very desirable that this experiment should be multiplied over the country so that a definite rule can be arrived at for future guidance.

CROPS SHOWN IN LBS PER ACRE.

Farm.	Manure applied	Superphosphates. Nitrate of Soda. Potash.	Superphosphates. *Nitrate of Soda (added as a top-dressing).* Potash.
Uitkyk— (Unmanured plot 2,490 lbs.)	Actual Yield	5,710	5,750
	Increased Yield	3,220	3,260
	Percentage Increase ..	129·3	130·9
Modderfontein— (Unmanured plot. 295 lb.)	Actual Yield ..	670	767·5
	Increased Yield	375	472·5
	Percentage Yield ..	127·1	160·2
Koekjespan— (Unmanured plot. 1,480 lbs.)	Actual Yield ..	2,020	2,080
	Increased Yield ..	540	600
	Percentage Yield ..	36·5	40·5
Slangkop— (Unmanured plot. 400 lbs.)	Actual Yield ..	700	750
	Increased Yield ..	300	350
	Percentage Yield ..	75·0	87·5
Alexandersfontein— (Unmanured plot. 2,980 lbs.)	Actual Yield ..	3,100	3,100
	Increased Yield ..	120	120
	Percentage Yield ..	4·0	4·0
Waylands— (Unmanured plot. 1,200 lbs.)	Actual Yield ..	2,330	1,560
	Increased Yield ..	1,130	360
	Percentage Yield ..	94·2	30·0
Oak Valley— (Unmanured plot. 1,770 lbs.)	Actual Yield ..	4,100	3,350
	Increased Yield ..	2,330	1,580
	Percentage Yield ..	131·6	89·2

THE EASTERN PROVINCE.

In parts of the Eastern Province the value of artificial manures is only beginning to be appreciated, and the experiments have to assume a more simple form. With a view to discovering what manure gives the best results, and approximately what amount to use, the experimental plots each represented 50 lbs. of seed, to which in each case an equal amount of manure, (50 lbs), and on a neighbouring plot a heavier application, was given.

MANURES AND CROPS SHOWN IN POUNDS PER 100 LBS. SEED SOWN.

KEURFLATS, KNYSNA.

Manures Applied.	No Manure.	100 lbs Guano.	100 lbs Complete Fertiliser.	100 lbs Basic Slag and Nitrate of Soda.	100 lbs Basic Slag and Potash.	100 lbs Basic Slag.	100 lbs Basic Slag, Nitrate of Soda, Potash.	100 lbs Superphosphates.	100 lbs Dissolved Bones.
Actual yield ..	1,664	2,400	2,400	2,160	2,160	2,160	2,008	2,280	2,120
Increased yield ..	..	736	736	496	496	496	344	616	456
Percentage increase ..	..	44·23	44·23	29·8	29 8	29·8	20·7	37·0	27·4
Value of increased yield at 3/- per 100 lbs ..	..	22/4	22/4	15/-	15/-	15/-	22/8	18/4	13/8
Cost of Manures ..	..	6/8	8/-	8/-	5/8	4/4	8/1	5/8	8/8
Nett profit per 100 lbs Seed sown ..	..	15/8	14/4	7/-	9/4	10/8	14/4	12/8	5/-

HONEYVILLE, HUMANSDORP.

Manures Applied.	No Manure.	50 lbs Superphosphates.	100 lbs Superphosphates.	50 lbs Basic Slag.	100 lbs Basic Slag.	50 lbs Dissolved Bones.	100 lbs Di-solved Bones.	50 lbs Complete Fertilser.	100 lbs Complete Fertiliser.	50 lbs Guano	100 lbs Guano.	Kraal Manure.
Actual yield ..	1,369·5	1,770	1,922	1,620	1,595*	1,860	2,178	1,782	2,040	1,946	2,100	2,281
Increased yield..	..	400·5	552·5	250·5	125·5	490·5	808·5	862 5	670·5	576 5	730·5	911·5
Percentage increase ..	..	29·2	40·3	18·3	9·2	35·8	59 0	26·5	48·9	42·1	53·3	66·6
Value of increased yield at 3/- per 100 lbs ..	..	12/-	16/7	7/6	3/9	14/5	24/2	10/10	20/1	17/3	21/11	27/4
Cost of Manures	..	2/9	5/6	2/1	4/3	4/3	8/6	4/-	8/-	3/3	6/6	..
Nett profit per 100 lbs Seed sown ..	..	9/3	11/1	5/5	6d loss	10/2	15/8	6/10	12/1	14/-	15/5	..

In addition to the increase in crop, the accompanying tables show the profit derived in each case. Naturally a liberal dressing of kraal manure has given the heaviest crop, but it is just on account of the scarcity of that valuable article, that recourse must be had to artificial fertilisers. The established belief in the value of guano is fully confirmed by these experiments. Only one return seems somewhat questionable, that marked with an asterisk; it seems unlikely that basic slag would have so little effect as is shown, insufficient in this case to cover its price.

At Keurflats on the poor soil of the Knysna coast, complete fertilisers and guano proved very effective, while a phosphatic manure with the separate addition of potash and nitrogen gave comparatively poor returns, showing conclusively the need of all the different plant foods, phosphates, nitrogen, potash and lime.

Arrangements were made for a number of other experiments but of these some were spoilt by locusts and others by snails, while on account of the drought a number had to be given up for this season. It is to be hoped that with the improved prospects for the next year, there will be an increase in the number, and in conclusion the invitation may be repeated to all who care to commence such enquiries, to place themselves in communication with this Department. It is only by such direct interrogation of the land and crops themselves, and by actual observation of plots growing side by side but differently treated, that valuable lessons in the business of arable farming may be learnt. Text-books in chemistry or accurate chemical analyses are undoubtedly useful as adjuncts to the methods of experiment, but can never be as conclusive or reliable, nor are they, as experimental plots assuredly are, plainly written on the ground, that all who run may read.

UNITED VINE AND FRUIT-GROWERS' CONGRESS.

EAST AND WEST AT OUDTSHOORN.

FIRST DAY, TUESDAY, MAY 16.

The first Congress of the Vine and Fruit-growers' Association representing the whole Colony, opened in Oudtshoorn on Tuesday, May 16. Hitherto the Eastern Province Horticultural Board has arranged for congresses separate from those held by the Western Province Horticultural Board, and this is the first occasion upon which the two groups of associations have held a joint Congress.

The following delegates were present:—W. H. Lategan and H. E. V. Pickstone (Constantia), P. Havers and W. A. Krige (Stellenbosch), A. M. S. Mostert and R. Taylor (Paarl), P. J. Cillie (Wellington), T. Micklem and F. F. Versfeld (W.P. Agricultural Society), J. H. Loubscher (Graaff-Reinet), W. Goulden (East London), John Landry, jun. (Cathcart), J. Leighton (King William's Town), T. Willows and J. W. Venables (Chalumna), E. A. Coulter, A. Page, and H. G. Flanagan (Komgha), E. T. L. Edmeades and W. Taylor (Oudtshoorn), O. and I. van der Westhuizen (George), F. Muller Rex (Secretary Oudtshoorn Farmers' and Fruit-growers' Association), E. Pillans (Horticultural Assistant, Department of Agriculture), C. W. Mally (Government Entomologist, Department of Agriculture), and F. D. Macdermott (Editor, *Agricultural Journal*).

Mr. E. T. L. Edmeades (President Oudtshoorn Farmers' and Fruit-growers' Association) was elected Chairman, and in opening the proceedings extended a most hearty and most cordial welcome to the delegates who had come from all parts of the Colony to attend the Congress. This was the first time a Congress of this nature had been held at Oudtshoorn, but he hoped it would not be the last. They were getting re-united (hear, hear), and he hoped the re-union would be lasting, because it was only by meeting together in Congress that they could make their voices heard and their requirements known. It was at congresses of this nature that they could bring to the Government of the country their requirements. It was most gratifying to have members who had travelled hundreds of miles to attend the Congress.

Mr. Wrensch (Civil Commissioner) said he had great pleasure in extending a hearty welcome to the delegates. He trusted that the result of their deliberations would be of benefit to all the Colony at large, and that it would be the means of supplying a want in this Colony—a system of co-operation amongst the farmers. One read a great deal about co-operation in other countries, and if it were taken in hand there was no doubt that the same success would attend it as attended it in other countries. (Hear, hear.) In this Colony it would be the means of bringing together the people of the country, and making them work not only for their own benefit, but for that of the country.

The Mayor (Mr. Curtis) and the President of the Chamber of Commerce (Mr. Wallis) also spoke, welcoming the delegates.

The Secretary read a letter from the Hon. C. W. H. Kohler, M.L.C. (Acting Chairman W.P. Horticultural Board), regretting his inability to be present, and wishing the Congress success.

THE WINE INDUSTRY AND THE NATIVES.

The first item on the agenda was "Colonial Wine Licenses and proper facilities for the sale of natural wines."

Mr. Lategan (Constantia) introduced the question. He said they all knew how bad the wine trade was in the Western Province at the present time. They thought that a remedy would be to issue licenses for the sale of Colonial wines only, and that the restrictions be taken off in the Transkei Territories and in other parts of the Cape Colony. There were plenty of restrictions for natives, but none at all for the poor whites and the Cape boys. They could get as much liquor as they liked. In the Western Province their drivers were mostly Cape boys, and they could be trusted with valuable loads when they could get as much liquor as they liked. He thought that the restrictions should be taken away entirely with regard to natural wines, but they should prohibit the sale of brandy to natives. Let them have the natural wine, which did them no harm. He moved:—

"In the opinion of this Congress, it is most desirable, in the interest of our wine industry, upon which such a very large section of our community is dependent, and also to the interest and progress of our native races, that (*a*) licenses be granted for the sale of natural Colonial wines only; (*b*) that the present restrictions of the liquor law in regard to the sale of brandy be applied to all natives in the Colony, but that they should have the same unrestricted privileges in regard to the natural Colonial-grown wines as all inhabitants of the Colony; (*c*) that the wine so sold to natives should be consumed on the licensed premises; (*d*) that the Adulteration Act should be strictly enforced by Government on Colonial-grown wines and brandy."

Mr. Krige (Stellenbosch), in seconding, said the question was a very wide one, which affected the whole of the Colony. A very large portion of the population was dependent on the growth of the vine, and the trade was in a most deplorable state. They could not get an outlet for their wines, and in consequence had to sell below cost price. He was totally opposed to drunkenness in any shape or form, and would be very sorry to see drink allowed to be sold to anyone, but he considered that the natural wine injured no one.

Mr. Williams (Chalumna) suggested that as the majority of the delegates had not properly heard the resolution, it should be properly drafted and submitted to members, and brought up the next day.

This was agreed to.

INCREASED DUTIES ON IMPORTED LIQUORS.

Mr. Krige (Stellenbosch) moved: "This Congress urges on the Government that they should co-operate with the other Colonies to have the present duties on foreign spirits increased from 15/- to 21/- per proof gallon." He pointed out that under existing circumstances, since the Excise was put on, they could not compete with the imported stuff. By increasing the duties they would be placed in the same position as before, and if Colonial people wanted to drink imported stuff, then let them pay for it.

Mr. Havers (Stellenbosch) seconded, and the motion was carried unanimously.

CO-OPERATION.

Mr. Lategan (Constantia) introduced the important subject of co-operation. He said people had been talking about it for years, and there was no doubt that co-operation in other countries had greatly benefited the producer as well as the consumer, and yet they were doing absolutely nothing. In many instances the market was so blocked that they could get no sale whatever for their fruit and vegetables. He thought that each district should have its own co-operative depôt for fruit and produce. By this means they would bring the produce direct to the consumer. At the present time the farmer only got about 25 per cent. of the gross profits realised on his stuff, and the middleman got 75 per cent., and sometimes more. By having such co-operative stores in the different districts, they would enable the consumer to get a better, fresher and cheaper article. Co-operation was the very thing that they wanted, and yet they could not get the farmers to pull together. Something was radically wrong. With regard to co-operative wine-making they wanted more capital, and he thought the Government should come forward on the pound for pound system to help the wine farmers. At the Government Wine Farm they made a good wine, but it was sold at too high a price. There they were only producing samples in a small quantity. By combining with wine-growers of each district, and having co-operative stores, a great deal of good might be done. He moved: "That a simple scheme of co-operation be drafted, to be submitted to the Government."

Mr. Cillie (Wellington) seconded.

Mr. Krige (Stellenbosch) said he certainly thought the Government should help them. He found the people living away from the wine producing districts did not get the right article, and if they had co-operative societies working together it would be to the benefit of everyone concerned. The consumer would get his stuff cheaper. But they had not sufficient capital.

Mr. Micklem (Western Province Agricultural Society) said he would like to know on what lines they were going, and were they going to approach the Government to ask them to advance money to farmers or what? Most schemes of that sort were bound to fail. They ought to get down to bedrock.

Mr. Leighton (King William's Town) moved: "That this Congress affirms the desirability of a system of co-operation dealing with the sale of fruit and fruit products."

Mr. MacDermott said he would like to refer the delegates to a paper read at last year's Congress by Mr. Dubois, the Viticultural

Expert, which gave them a very good and clear idea of what could be done by co-operation. He thought that if a workable scheme were submitted the Government would be pleased to accept it. They heard a great deal about the political panaceas that were going to cure all the ills of this country. But the only real panacea that promised success was co-operation first, and next, cold trucks on the railways. Those were the two great necessities for encouraging production of all sorts and when they were obtained the position would be much better. He would impress upon the delegates the necessity for co-operation, for inland Cold Storage with slaughter stations and cold trucks on the railway (applause).

Mr. Goulden (East London) moved: "That this Congress affirms the principle of co-operation amongst wine-farmers and fruit growers as the best means of securing a full return for their capital and energy."

Experience had proved, he said, that it was the most difficult thing in the world to get farmers to work together. If they could once get the farmers united they would be all right.

In view of Mr. Goulden's amendment, Mr. Leighton withdrew his.

On the motion of Mr. Cillie (Wellington) the following words were added to the amendment:—" and that in the opinion of this Congress it is highly desirable that the Government should be approached to help on a financial basis where such co-operative societies are in need of monetary assistance."

Mr. Pickstone (Constantia) said he ventured to say that every single member of the Congress was in favour of the principle of co-operation. There was a great danger in allowing themselves to be led to depend too much on the Government. He thought it would be better to approach the Banks. He was perfectly certain that the Government would never advance money unless it was on a very sound security and they would never advance in co-operation in this country unless the farmers mutually trusted each other. That was the fundamental principle (Hear, hear).

Mr. Meyer said, it seemed to him that as long as co-operative societies were started why should not the Government act as a Bank?

Mr. Lategan said there was no necessity to go to the Government with regard to general produce but the wine farmers certainly wanted assistance from the Government. A matured wine had to be at least three years old before it could be put on the market and the farmer consequently had to keep three vintages before he could realise anything for his crops. That was the reason why they ought to have the assistance of the Government with regard to wine.

On the amendment being put it was carried unanimously amid cheers, and the original resolution accordingly fell to the ground.

The Congress then adjourned till the following day, being entertained to lunch by the Chamber of Commerce, driven round the town and out to Mr. G. Olivier's farm in the afternoon and attended a garden party in the evening given by Mr. and Mrs. Luntz.

This report will be continued next month.

COTTON SEED FOR FREE DISTRIBUTION.

Adverting to the interesting article on the cultivation of cotton in Cape Colony, written by Mr. Roworth, which appeared in the last issue of the *Agricultural Journal*, the Department of Agriculture has now to announce that the British Cotton Growers' Association has placed at their disposal a quantity of different kinds of cotton which is being distributed free to all applicants who care to make a trial with the same. Later on, arrangements for testing the markets on a commercial scale will be made, if sufficient cotton is produced.

The position at present is that while it is known that good cotton can be grown in certain districts of the Colony, it is as yet uncertain which are the most favourable parts, or where it is not going to succeed. Neither is the best mode of cultivation, the right seasons to sow nor the return per morgen known. All this information can only be acquired by actual experiment, and any farmers willing to make a trial will be doing a useful work for the Colony even if the results should be of a negative character.

It is impossible to say when the proper sowing season is in different parts of the Colony but much guidance will be found in the article alluded to above.

The preparation of the soil in the first instance may best be described as that suitable for mealies, and as regards sowing time it may be said that the cotton plant requires rain or water leading during the first four or five months but after that dry weather is an advantage for gathering the cotton.

The seed should be put in in rows five feet apart, and four seeds at a time every twenty inches. The exact and best distances can only be ascertained by trial.

Any farmer desirous of making a trial of cotton growing is requested to communicate with the Agricultural Assistant, Department of Agriculture, Cape Town, giving particulars as to the nature and extent of ground available, and the nearest railway station, when sufficient seed will be sent gratis to his address.

HORSES SUITABLE FOR MILITARY REQUIREMENTS.

The Horse Breeders of the Colony will be interested to learn that the Military Authorities are asking for information as to the number of horses which may be available during the next four years that will be suitable for military purposes. It is not so very many years since that this Colony supplied a large proportion of the military remounts for the Indian Service, and there is no reason why, with care and attention to the breeding and rearing of the right stamp of animal, we should not re-establish that industry. The demands of the recent war have played havoc with the best class of our general utility horse, but once breeders are encouraged to produce the same type again there should be no difficulty in meeting the demand. The Cape horse has established his virtues, and stands alone as the most suitable animal for service in this country, and it is gratifying and flattering to know that the military authorities recognise this fact.

In a communication received by the Government through H. E. the Governor, from Major General E. S. Brook, Commanding the Forces in Cape Colony, the following occurs:—

"In order to encourage Horse Breeding in this country and with a view to direct purchase of horses for the needs of the Army in South Africa, the Military Authorities are desirous of coming in touch with farmers in Cape Colony who may be desirous of being registered as breeders of horses suitable for the Imperial Forces.

"To enable the Military Authorities to form an estimate of the number of horses that may be forthcoming under this scheme I should be glad of the following information either from farmers direct or through the medium of Your Excellency's Ministers:—

"(1). The probable number of 4 year old Horses suitable for Cavalry (15 to 16 hands) available in the years 1906, 1907, 1908, and 1909.

"(2). The probable number of 4 year old horses suitable for Mounted Infantry (14 to 14·3 hands) available in the years 1906, 1907, 1908 and 1909.

"A list of farmers, with addresses, who may be willing to co-operate will be necessary, and should be revised annually."

Those farmers who desire to fall in with this suggestion should register their names and addresses with their respective local Civil Commissioners, who will forward these details to the Under Secretary for Agriculture, together with such particulars asked for in the above communication as they may be able to supply. A record will be kept in the Department of Agriculture for the information of the Military Authorities, and it is hoped that thus an encouraging impetus will be given to forward the re-establishment of that most important farming industry, the breeding of good serviceable horses for remount purposes.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month Should a correspondent deem his enquiry urgent, he should say so, and an answer will returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith A *nom de plume* may be attached for publication.

Flood Irrigation Works at Nelspoort.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read with much interest the description given of the valuable work done by Mr. W. R. Southey on his farm "Varkenskop," which appeared in the January number of your Journal, and I thought a description of a somewhat similar work, but on a very much smaller scale, might be of some benefit to the farmers in the Midlands. who may wish to construct similar "weirs" at a, comparatively speaking, small cost. If you think it of sufficient interest, will you be good enough to publish the following in your Journal?

The work was constructed last winter by Mr. Archie Rose-Innes, on the farm "Klipkraal," also known as "Salt River Farm," which is situated within two miles of Nelspoort Station, in the Beaufort West district, and on the main line of railway to Cape Town.

The "weir," commonly known in these parts as a "wire dam," is constructed across the Salt River, which, before reaching the farm, receives the drainage of many hundreds of square miles of country. The materials used in its construction were 1,200 buck wagon loads of large iron stone, 65 rolls of No. 8 galvanised steel wire, about 50 bags of lime, and 1,100 anchors or holdfasts. The iron stones were neatly packed in a double wire netting, the meshes of which were six inches by four All the nets used were made on the spot. The 1,100 anchors were made of old fencing posts, eighteen inches long, to which was fastened a double wire. They were then placed in different positions all over the bed of the river, on the site of the "weir," and thus built firmly in the "weir." The wire netting having been completed over the "weir," these anchors were then attached to the wire netting as firmly as possible, which will protect the netting from any damage that may be caused by stumps, trees, etc., passing over the weir when the river is in flood.

The weir is 130 feet wide from the west to east bank of the river, 76 feet being built on sand (no solid foundation being available) and 54 on a limestone foundation. The height of the above 76 feet from the bed of the river is nine feet, and that of the 54 feet from five feet gradually running to a level with the limestone bed.

The weir is protected on the west bank by a solid masonry wing built far into the bank, provided with a sluice regulating the supply to the furrow. Another solid masonry "pier" twelve feet long by nine feet high, is built on the weir for the purpose of diverting the water when the river is in flood to the opposite bank. There is also a masonry wall from the level of the furrow sloping down on to the whole length of the weir, so as to protect the furrow from any "back wash."

The spring in the river about 500 yards above the weir is most permanent, and so strong that the agricultural lands can be irrigated with the run of the spring.

Salt River was in heavy flood for four days during last month, and I am pleased to say that the weir stood the strain above all expectation, for not a single stone was removed from its place. This is a vast improvement upon the old primitive method of constructing these "wire dams," viz., partly with stone and partly bushes, necessitating the construction of bran new weirs every three or four years.

Mr. Archie Rose-Innes lives on the farm, and will be only too pleased to give any information as to the construction and cost of this "weir."

Trusting that our small undertaking may be the means of inducing others to follow suit, and apologising for the length of my contribution,—Yours, &c.,

A. Rose-Innes.

Murraysburg,
8th April, 1905.

The Araucaria at Graaff-Reinet.

To the Editor, Agricultural Journal.

Sir,—I have followed with much interest the article appearing in the Journal on "Extra Tropical Forestry," by D. E. Hutchins, Conservator of Forests, Cape Town. On reading this month's continuation of the above article, I notice an extract from my report on the Botanic Gardens for the year 1900, dealing with *Araucaria excelsa*. The article ridicules the idea of my trying or attempting to grow the above tree successfully, except by treating same as an exotic. Well, I must differ from the Conservator of Forests on this point, and by producing convincing evidence in support of my contention that *Araucaria excelsa* can be grown successfully here in this district. I enclose you photographs taken to prove this point.

No. 1 is the young tree mentioned in my report of 1900. This was planted at the end of that year, a small tree some two feet six inches high. It has had no special treatment, no more than our ordinary trees get: that is watered about once a month, and with very brak water at that. The tree now stands 10 feet high, which I consider very good growth for this tree. Of course, the Conservator of Forests admits it will grow for a few years only and then gradually die off.

No. 2 photograph shews two very fine and well-grown trees of *Araucaria excelsa*. The trees are growing in front of the residence of Mr. Wm. Lawrie in a main street with a northerly aspect, where they have absolutely no shelter or breakwind. They have fine solid trunks, sixteen inches in diameter, three feet from the ground. Soil they grow in has no water led on to it. It is hard under calcareous ferruginous concretion, but this tree has power to penetrate it and thrive, and I can trace them back as being there for the past thirty-eight years.

No. 3 photograph is *Araucaria elegans*, also a good specimen some twenty-five to thirty feet high. This must have been planted in the gardens here a good number of years, to attain this size. It is in perfect condition, and, up to the present, shows no signs of going back. I may state in no place in the Gardens here have we more than about two feet of good soil, and then we come to a hard concrete pan, which these trees have the power of penetrating to a considerable depth.

No. 4 photograph is a splendid specimen of the cork oak, *Quercus suber*, which I see doubted as being hardy and liable to suddenly and unaccountably die off. This tree is the finest I have seen of this variety in the Colony, and is much admired by visitors, and to quote a recent visitor who admired this tree, also the above, I might mention Mr. H. E. V. Pickstone, who was here on a visit a few days ago. This tree must have been planted in the Gardens at least forty to fifty years, and has adapted itself admirably to the climatic conditions of the Karroo.

After taking all the above points into consideration, I think I am quite justified in endeavouring to grow *Araucaria excelsa*.—Yours, &c.,

C. J. Howlett,
Curator Botanic Gardens.

Graaff-Reinet, April 25.

The accompanying photographs bear out all Mr. Howlett says, and we regret that pressure on our space precludes their reproduction. We brought them to the notice of Mr. Hutchins.

Osteo-Porosis.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—With reference to the article on "Osteo-Porosis" in your April number, and to your paragraph on this subject on page 502. I beg to refer you to my third report, which gives an account of my experience of this disease at Middelburg Camp, C.C., from October, 1904, to March, 1905. A copy of this report has been sent to your Veterinary Department.

I am not going to argue as to what is the proper name to give to this disease, nor am I going to try to show that we are dealing with two or three different bone diseases, but I will simply state that during the past seven years I have at times seen in this country a peculiar bone disease amongst horses, mules and donkeys, which often assumes various forms and symptoms My chief experience of this disease has been at Wynberg, Cape Town, in 1898-1899, and at this camp during the past seven months.

My experience in the treatment of this disease has always been the same, viz., that in cases which are not too far gone, if the diet of oat-hay is discontinued and the affected animals put on a good diet, such as good imported oats and bran, good imported clover or hay, and some green forage, and if ordinary care is taken as regards management, they will recover, and recover, in most cases, permanently, without moving them to a different locality.

I suggest some such ration as the following per diem for an average-sized horse:—

Oats, imported	8 lbs.	to be given mixed.
Bran	3 lbs	
Imported hay, such as Argentine lucerne ..	6—8 lbs.	
Green forage or roots, &c.	3—4 lbs.	
Salt	1 oz.	

Do not tie up the affected animal—let it be loose in a box or kraal, so as to exercise the joints and allow of lying down more. Avoid chills, and keep the animal fairly warm and never exposed to severe or cold winds. As the patient improves, give a little exercise or turn out to graze in the day-time.

I have had great success with this treatment, and recommend some of your readers to try this on any of their affected animals.

At this station lately, out of about 350 affected mules, about 280 were cured, and are standing hard work; and this without moving them to other localities, as stated by your Department to be necessary—*vide* page 543. The proportion of donkeys cured was about the same. My experience at Wynberg was similar, and I should like to know how your Veterinary Department reconciles my experience with their statements about this disease. That moving the affected animal to a different locality has proved beneficial in many cases I can fully understand, as in those cases the animal was moved to a limestone district.

This disease, I think, must bear some strong relationship to the bone disease in cattle, which you acknowledge to be due to want of lime-phosphate in the food.

I may add that the Agricultural Department at Pretoria has analysed two samples of Cape Colony hay, which has been fed here, and these samples show a considerable deficiency of phosphate and lime, as compared with the average in Great Britain and as compared to Transvaal oat-hay.

In consequence of your remarks in the paragraph above mentioned, I should be glad if you would publish this letter.—Yours, &c.,

A. H. LANE, Capt. A.V D.

Middelburg, C.C., May 10, 1905.

The Originating Cause of Redwater.

To the Editor, AGRICULTURAL JOURNAL.

SIR, In the *Cape Times* issue of the 31st ult. Mr. Robertson, Acting Chief Veterinary Surgeon is made to say:—"The theory of the Agricultural Department was briefly this: The German authorities have been purchasing cattle in what is known as the clean districts of the Colony, and have been taking them to districts like Queen's Town, Dohne and East London, where Redwater is rife, and where they probably picked up ticks affected with Redwater. It is well known, of course, that when the animals pick up the Redwater tick, a period of from 12 to 13 days elapse before the disease manifests itself. This is what the Agricultural Department think has happened. The cattle in question have been grazed in the vicinity of East London, and the disease had begun to break out on board ship and would be greatly aggravated by the sea voyage, and the fact of the animals having to drink water from the condenser, etc., etc."

In the early days of the outbreak of Redwater in the Colony, the Colonial Veterinary Surgeon, Mr. Hutcheon's theory of Redwater to us farmers was as follows. When cattle infected with Redwater come on to clean veld what passes from them infects that veld but no harm will come to cattle running on that veld that season. But the year following when the rains fall, and the grass grows and the atmosphere is suitable to liven the germs of the disease, then the cattle grazing on the veld will sicken.

You will observe that Mr. Hutcheon did not say one word about ticks, and on the other hand Mr. Robertson, Acting Colonial Veterinary Surgeon, does not say a word about the veld being infected other than with ticks. Will the Agricultural Department kindly publish the above and tell us farmers now which is the correct theory.—Yours, etc.

W. G. FEATHERSTONE.

Stanhope, near Kei Road, April 17, 1905.

In reply to Mr. W. G. Featherstone's letter in which he directs attention to the different theories expressed by the officers of the Veterinary Department with respect to the etiology of Redwater in 1883 and 1905, I wish to state that the originating cause of Redwater was not known in 1883. All that we then knew was that it was a specific disease, which had a period of incubation or latency. That is the period that was known to elapse between the date on which susceptible cattle were permitted to graze on infected veld and the date on which the disease appeared in those cattle. We also knew that the infection was carried by cattle only—but it was carried by cattle which had recovered from the disease just as readily as by cattle suffering from the disease, so long as they came from an infected area. We further knew that the disease was not communicated direct from a sick to a healthy animal, but that the infective agent was in the first place communicated by the affected or recovered animal to the veld, and that healthy susceptible cattle grazing over that veld contracted the disease. If the affected cattle grazed on clean veld early in the summer months, healthy cattle were liable to contract the disease on that veld during the same summer. But if the diseased cattle were brought on to clean veld late in the summer or autumn, the disease would not be likely to manifest itself amongst the local cattle until the following summer. It was observed to be from five to six weeks between the date on which Redwater cattle were first brought on to clean veld, and the date on which the disease appeared amongst the local cattle. We naturally concluded at that time that the infective agent, whatever it was, which Redwater cattle conveyed to clean veld, required a certain period—about five weeks—to undergo the necessary development of its pathogenic properties. Since the discovery by Drs. Smith and Kilborne, of the United States, that a certain species of tick is the medium of harbouring the infective agent of Redwater, and conveying it to healthy cattle to which they attach themselves, we know now what is the cause of that interval and many other peculiarities relating to the origin and spread of the disease.

Mr. Featherstone will understand, therefore, that it is equally correct to speak of veld infected with Redwater and veld infected with Redwater infected ticks.

Horse with Chronic Sore on Side of Head.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Would you be kind enough to advise me in the following case. I have an English horse that last autumn developed a swelling on the side of his head, and shewed the usual symptoms of strangles.

I opened the swelling when ripe, and washed it regularly with Little's dip, and dressed it with Stockholm tar, treating the horse as advised by Mr. Hutcheon in his "Diseases of the Horse." In the spring I turned him out to grass, leaving off the treatment, but I found on catching him the other day there was still a slight discharge from the sore. The horse is very fat and in perfect order, except for this discharge of matter, and this does not affect him at all. I should be most grateful if you could advise me what to do, in your excellent Journal, which I may say is as much appreciated in the Orange River Colony as in any part of the Cape Colony.

Apologising for trespassing on your valuable space.—Yours, &c.,

"ORANGIA."

I am of opinion that the swelling which developed on the side of the horse's head, was not strangles—the swelling of which usually appears between the branches of the lower jaw—but the result of some injury, and that the chronic discharge which continues to flow from the sore is due, most probably, to the bone being injured, and small portions of it becoming ulcerated, and keeping up the inflammation and discharge. The only other suspicion is that in opening the swelling the duct of the parotid salivary gland, or the gland itself may have been cut open. In the latter case the fluid which would run from the opening would not be pus, but semi-clear fluid, and this would flow most abundantly when the horse was feeding, and almost cease when he was not feeding. *Treatment*: If it is pus which discharges from the wound, carefully open it, and with your finger feel for any small loose pieces of bone, and if there are any present, remove them. Keep the wound open, and dress it well with a strong solution of Jeyes' fluid or Little's dip. Fasten a piece of clean rag round the point of a small stick like a pen-holder, dip this in the dressing, and insert it into the wound, so as to dress it well to the bottom. The first dressing may be done with the pure fluid or dip. Try and get the wound to heal from the bottom. If you suspect that the duct of the gland is cut, you should apply a blister to the part. This will cause healthy inflammation in the surrounding tissues, and induce the wound to heal up and close the duct. The common cantharides blister will answer, rub it well in all round the sore. -D. HUTCHEON.

Cool Storage for Butter, &c., in transit by Rail

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We hear a great deal nowadays of the necessity for farmers co-operating for the disposal of their produce, more especially, perhaps, where "perishables" are concerned. Doubtless much good will be accomplished by such united effort, but unless Government co-operates as well, the beneficial results which should accrue will, to a great extent, be vitiated.

What is absolutely necessary in dealing with "perishables" is careful, speedy and cool transit. The question arises do these conditions (as a whole) exist at the present time? I say decidedly not. (I speak from actual experience). Possibly "speed and care" may exist to a certain extent, but what is (if anything) more essential, namely cool storage, does not.

Here then Government can show its practical interest and co-operation, and surely it is not a great thing to ask! As an instance of what other Governments are doing in this respect (without going out of South Africa) let us look to Natal. There we find the Government going to the trouble and expense of endeavouring to bring producers (farmers) and consumers (general public) into direct touch with one another. Lists of producers willing to supply and consumers agreeable to purchase have been completed, and this, I venture to say, cannot fail to be of immense benefit to both, as well as attracting more traffic to the railway.

Whilst strongly opposing the idea that Government should do more than its fair share of the business, I maintain that they are not doing what they might and can,—consequently those who are trying to help themselves find their efforts impeded through want of proper provision to deal with the traffic in question.

I am aware that the question of putting on a "cool' van has often been mooted, but, if I mistake not, as often "shelved" on the score of expense or the plea "it won't pay." The "won't pay" part of the business may be perfectly true, but it would be interesting, and instructive, to know if "won't pay" was arrived at as the result of actual test, or is simply an expression of opinion.

On the principle that "a half loaf is better than none," if a "whole" cool van "won't pay," try and see if a "half" one will. Surely it is not beyond the "realms of possibility" to have a compartment constructed in, say, the guard's van, in which butter could be placed, and kept cool by one of the many simple and inexpensive methods in general use! If such convenience existed I feel sure consignors (or consignees) wouldn't object to paying a little extra to have their butter conveyed in this manner. As a case in point, one may send butter to Port Elizabeth and almost rely upon it arriving there in a semi-liquid state should the weather be a little warm.

What encouragement is there to attempt doing business under these conditions? It simply means curtailing traffic, which is surely not the intention, though decidedly the effect!

Personally I see not the slightest difficulty in the way of providing a modified form of cool storage, and the sooner it is called into being the better.

I have mentioned butter, specially, as I believe dairying will go on increasing year by year if proper facilities are provided. Of course there are other "perishables" to be considered, but none so general to the whole Colony as dairy produce.

Hoping to see the matter taken up and practical results follow.—Yours, &c.

"PERSEVERE."

Dwaal, May 2, 1905.

Baboons and Jackal-proof Fencing.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—After having gone to considerable expense in erecting jackal-proof fencing, the value of my paddocks to me is considerably diminished by the fact that baboons climb over and destroy young lambs if I allow them to run free with their mother, or make openings for jackals by overturning the stones which have been packed along the fence to render it jackal-proof.

Could you possibly give me some information as to the cost of an electric battery strong enough to kill these animals, including the cost of insulators and wire for 500 yards. It might be safer perhaps to use a battery which would only paralyse for a short time—this to escape a charge of culpable homicide in case bipeds other than baboons were visitors.—Yours, &c.,

WORRIED.

Meat Supply

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In your issue of this month (April) there is in an article on our meat supply, a note in which the author says, in computing the number or percentage of lambs reared: "In some districts where much loss from disease is suffered, *e.g.*, Hay and Herbert, the percentage is probably less than 50 per cent. lambs reared."

I don't know where Mr. Du Toit gets his information, but with regard to Hay, if he will turn to the returns issued by the Chief Scab Inspector (Mr. Davison) for six months ending December last, a year of unprecedented drought, lamziekte and all other ziektes, he will find that the total number of small stock in this division (Hay) is 416,186 in 995 flocks, and the total deaths from all causes are only 29,760, and this in a year of extraordinary drought. Then during this year, in the early part and end of 1903, we saved for the Colony no less than about 150,000 to 200,000 small stock besides cattle and horses. How, after these figures, any man can call the Division of Hay unhealthy for small stock is past understanding.

I have not yet been able to go through this article carefully, but I could not allow that statement to go unchallenged, as far as Hay is concerned.

Thanking you in anticipation,—Yours, &c.,

THOS. J. CARLISLE,
Hon. Secretary Hay Farmers' Society.

Postmasburg, April 19.

A Mammoth Pumpkin.

To the Editor AGRICULTURAL JOURNAL.

SIR,—A paragraph appeared in the *E. L. Dispatch* regarding what was termed a mammoth pumpkin, weighing 82 lbs., exhibited at Kimberley, a few days ago. It may interest your readers to know that I saw one last month, grown in the Residency garden, Engcobo, Transkei, which weighs 120 lbs. exactly I was present when it was put on the scale, and can therefore vouch for the accuracy of the weight.—Yours, &c.,

K.

Engcobo, April 22, 1905.

The Moon's Influences.

To the Editor AGRICULTURAL JOURNAL.

SIR,—A man gardening on my farm will sow no seeds excepting at new moon. We, farmers, in South Africa, sow when it rains, and never bother our heads about the moon. I have also heard some people say you should not castrate lambs, etc., from new till full moon, but any time after that. I am sure many farmers would be glad to have this matter cleared up. Can you give us any information?—Yours, &c.,

A. P.

Komgha, April 12.

We regret we cannot. The influence of the moon on plant or animal life has not come within the scope of our observations.—ED. *A.J.*

Abnormal Milking Goats.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Like Mr. Ivan Pentz, I have two female goats, which, when they were only four months old, gave milk, and, as they gradually grew older, they gave up to half pint of milk each per day till they kidded. But, strange to say, that, although one she-goat's kid died, she remains in milk, although I did not milk her for 1½ months, and she still gives good and sweet milk.

She is bred from a thoroughbred Swiss goat ram (from Mr. W. Konschel's imported flock, Uitenhage), with a Boer she-goat. I must honestly say that this cross-bred gives fine heavy fleshy, and good milch goats.

ROBT. MAEDER.

Colesberg, April 6.

The strain of goat imported by Mr. Konschel, of Uitenhage, is that known as the Toggenburg, and was fully described in the *Agricultural Journal* in 1902.—ED. *A.J.*

Lime and Sulphur as a Sheep Dip.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have been reading with much interest the several letters in your issue for April, on the merits and demerits of lime and sulphur dip as a cure for scab.

As a farmer of more than fifty years' experience of sheep farming in South Africa, whilst admitting that many of the proprietary dips are a cure for scab, I unhesitatingly say that lime and sulphur dip is the surest and best dip, and that until its sole and universal use is made compulsory, we shall not get rid of scab in this country. No one can blame the proprietary dip people for running down sulphur and lime dip.

There appear to have been some complaints from woollen manufacturers as to the injury done to the wool by the use of sulphur and lime dip. There may be some grounds for the complaint, but I have not heard of anyone who uses this dip, constantly and solely, getting any lower price for his wool in consequence. I have repeatedly attended wool sales in Port Elizabeth, and have never heard any remark as to any particular wool having been dipped in any particular dip. I believe that properly mixed and made-up, this dip would not be injurious to the wool. I should imagine that it would be the duty of the Inspector to see that the dip was properly made in the case of anyone who was too ignorant to read the written instructions, or too stupid to carry them out.

I use 18 lbs. lime and 20 lbs. sulphur (the lime unslaked), to 100 gallons of water, boiled until a deep orange colour. I have three 30-gallon pots alongside my tank. The evening before dipping I boil enough sulphur and lime to fill my 400-gallon tank, filling up with water, so as to get the required strength. I have an empty cask with the head out standing in the draining yard just above the tank. This cask has a hole about two inches in diameter, four inches from the bottom, with a bung to fit the hole. The dip is taken out of the pots and thrown into the cask. In a few minutes the grit has all settled to the bottom, and on pulling out the bung a quite clear, dark liquid pours into the tank The pots are kept boiling the whole time we are dipping, so as to keep up the proper temperature and strength and keep the tank filled.

My experience of lime and sulphur dip is that it is not only a cure for scab, but also a disinfectant. Six months after dipping, if damp weather prevails, the lime and sulphur can be smelled on the sheep.

I came out from England in 1853 to learn farming with a man who, previous to coming here, had been a sheep farmer in Wales, and was, therefore, fully alive to the great injury scab did to his flocks. In those early days, fifty years ago, hand-dressing was the only means used. For very bad cases we had a "kuip" (horse or ox hide formed as a tank.) The sheep was taken by one man at the front legs and one at the hind legs and dipped in upside down, and the dip pressed out by hand. We used a decoction of aloe leaves and tobacco, boiled together—either or both these remedies might have been good But the decoction did good. I also used a decoction of tobacco alone, which I found a good dip. But the trouble was that the tobacco varied so in strength.
I have used most of the proprietary dips in my time, but never got my flocks free from scab until I took to using sulphur and lime dip only.

For a great many years before the war my flocks were quite free from scab, Having to shift my sheep away to the vicinity of a military camp for protection during the war, my sheep got infected with scab. I cured them with sulphur and lime dip. Again, at the conclusion of the war, a speculator bought 5,000 loot sheep, dropping to pieces with scab, and put them on a farm close to mine in charge of a couple of natives, and without any proper supervision Consequently the sheep were wandering about the country by hundreds, and constantly mixed with mine. My flocks got badly infected. Two dippings of sulphur and lime quite cured them, and since then I have not had a spot of scab amongst my flocks, and have not since dipped any of my sheep.

The Scab Inspector for my ward can bear me out in this statement, as he only has to make a formal visit to my flocks, knowing that he will not find any scab. If one man can succeed in eradicating scab on his farm, why not all?

I attribute my success solely to the use of sulphur and lime dip. Why must we be taxed to keep an army of Inspectors and sub-Inspectors, costing, I believe, £80,000 per annum? Fortunately we have a first-class man at the head of the Scab Department. But, unfortunately, the Act has been so watered and spoilt through hostile and ignorant opposition as to become more or less a nullity. The clause in this Act providing that Inspectors be elected by the people, has in many instances put not only ignorant and unqualified people in as sub-Inspectors, but, in many instances, people who are positively opposed to scab regulation.—Yours, &c.,

E. BAGER COOK.

Thornhill,
May 3rd, 1905.

The Eradication of Scab.

To the Editor, AGRICULTURAL JOURNAL.

SIR, —I have followed the various suggestions in Mr. M.'s letter, of East Griqualand, February 25, 1905. I cannot agree with Mr. M. in his remarks that Cooper's will cure scab in one dipping. One dipping of Cooper's dip would stop the scab for a short time and it would appear after three weeks. This has been my experience with Cooper's dip. I quite agree with Mr. M. that Nicotine or Arrow Brand tobacco extract will cure scabby sheep in one dipping That I have experienced.

I. I don't agree with Mr. M. that dips should be supplied at cost for only two years and then each farmer to get it from where he can, as he can plainly see that scab will not be eradicated in South Africa in two years, as we have had the present proclamation in force in the Transkei and Territories for the last seven years and not eradicated scab as yet.

II. I don't agree with Mr. M. in reducing a farmer's flock to 200 or 300 as every Inspector will tell him that every scabby flock of sheep in his area are cleansed in the time provided by the Act. If not, he has the law to force him to do so.

III. I would like to ask Mr. M. what would become of the remainder of a flock of sheep after an inspector had come with a gang of Natives and sorted all the scabby ones out. And does he consider the remainder of the flock clean; does he think that a bonus could make an Inspector cleanse his area of scab?

IV. Does Mr. M. think it possible that every Inspector could go round once a month in his area and take each scabby sheep out of every flock? Yours, etc.

W. E. GRAY.

Talorgan, P.O. Elliott.

To the Editor, AGRICULTURAL JOURNAL.

SIR, Reading a letter published in the April *Journal*, written by a Griqualand East farmer, not signing his name (it would perhaps have been better had he done so), I was rather amused at his suggestions. Now, when a farmer's stock has to be reduced to 200 or 300 head because he cannot, or does not know how to, cure scab, it is hard lines; but as a farmer has given these suggestions, he does not suggest what is to be done with the remainder should a man have, say, 1,000 head.

To allow each inspector a gang of natives to dip all scabby sheep should not be done, until good all-round practical men could be found to fill the position of Scab Inspector, or else it will be like putting a mad man on a horse's back and letting him ride to the devil.

And, lastly, as to confiscating all scabby sheep, I think this ought to be left to each farmer to do. If inspectors are allowed to do this, the farmer will want men who know what scab is, and not those who delight in issuing summonses to farmers because they see a sheep with a bare patch where bush-lice have bitten it, or where a goat is casting his hair, because the farmer failed to report it. Until thoroughly reliable men can be obtained for all the districts, these suggestions would be a serious drawback to the sheep-farmer. Perhaps if the writer of the letter had "stock gras" and droughts to contend with, the same as we have had the last few years, he would not have thrown out these drastic suggestions.

Thanking you for the interesting and valuable information given us every month,—Yours, &c.,

A. C. HUNT.

Espach's Drift, Barkly West.

RURAL REPORTS.

For the month ending 15th May, 1905.

Aberdeen.—We have had a good rainfall here this month and quite up to the average. The veld is looking well, though locusts have done some damage during the last two weeks; they have now left, going in a northerly direction. What crops have been reaped are very small, and forage has to be imported. Lucerne is still looking well for this time of the year. Cattle are now improving and in fair condition. Slaughter animals are scarce, but in good condition Horses, mules, etc., remain in fair condition; they are not in much demand at present owing to the scarcity of fodder. Sheep and goats are both doing well. Hair promising and kidding last season has been good. Ostriches are improving and in good condition on the whole, few chicks, however, have been reared, owing to the drought. Very few pigs in the district.

Barkly West.—Good rains have continued to fall in this district and there is every prospect of fair crops being reaped, particularly on the Sekin and Majagoro Locations. Large swarms of locusts are, however, appearing, and it is much to be feared that they will do a great deal of damage.

Bedford.—Intermittent rains have been falling this month, but they have been exceedingly partial and of the stormy type. What we require are some good soaking rains. The veld in parts shows a slight growth, but is very short, and not likely to last into the winter without the aid of soaking rains. The rains came too late to enable the farmers to cut much lucerne hay, but the lands are green, and will, however, at any rate produce a little feeding for poor stock. Cattle are in low condition still. Large numbers have been sent away to the O.R.C. and Bechuanaland to find pasture. Slaughter stock are very scarce. Small stock are doing rather better than cattle, and have been putting on condition since the slight rains fell. Ostriches are also improving, as they manage to feed on the short green grass.

Carnarvon.—We are having fair weather here at present. An average rain has fallen this month and veld has improved slightly, though injured somewhat by flying locusts. There are no crops at present, as sowing is just beginning. Cattle are in fair condition. There are no slaughter animals to be had. Horses are in good condition. No breeding. Sheep and goats, however, are not doing quite so well.

Hay.—Prospects are very poor and discouraging in this district. Rainfall has been practically nil so far; the veld is in very bad condition, and what there was of it has been eaten up. Cattle are in bad condition, slaughter stock scarce. Horses are in fairly good condition still, sheep pretty fair, but goats bad.

Herbert.—Rain has again fallen on the locations, and a hailstorm did a great deal of damage at Locations Nos. 1 and 2, where it practically destroyed all the crops, tobacco, etc., and has also broken down the trees and destroyed the pasturage. The natives state that the hailstones were larger than any they had ever seen before. Swarms of locusts are eating up all the grass on the locations, and the outlook for the coming winter is anything but bright, and I anticipate heavy losses in stock during the next six months.

Malmesbury.—This season's rainfall has been heavy and a good way above the average. At the present time the weather is rather dry. Veld in fair condition. Wheat crop is fair and oats abundant. Cattle are in fair condition, and the calving season has been good. Slaughter stock are in good condition and prices high. Horses in good condition. Draught animals are scarce. Mules plentiful. Markets are firm, and good animals command high prices. Sheep are not in quite the condition they should be at this time of the year. Pigs are mostly doing well.

Oudtshoorn.—Our weather was splendid during the earlier part of the month, but has become rather unsettled of late, windy at times with cold frosty nights. The rainfall during the past month has been very light, and below the average for this time of year. Veld is in fair condition. Mealie crops promise to be fair. There has been a good yield of lucerne seed, and great efforts have been made to eradicate dodder. Cattle are in fair condition and free from disease. Slaughter animals in good condition, but scarce. Horses are also doing well and fetching high prices, although there have not been many sales of late. Ostriches have to be fed artificially on many farms still. Pigs thriving well and in good condition.

Queenstown.—Rainfall during the past month has been light and rather below the average than otherwise. We are having lovely, bright, warm days, and only need more rain. Veld is looking very green, but the grass is still short. No sowings have taken place owing to the drought. Cattle, with exception of cows, in fair condition. Horses doing well on the whole. Sheep in good condition, but no lambing yet.

Riversdale.—The prevailing weather in this district during the past month has been dry and windy. The rainfall in some parts has been good, though others report light rains. Veld is in good condition. Mealies and lucerne are yielding good crops. Farmers are busy sowing oats at present. Chief fruits are pears, apples, peaches, and oranges. Livestock of all descriptions are in fair to good condition.

Somerset East.—I regret to have occasion to chronicle that the interminable drought has caused very serious losses amongst livestock. Many hundreds of cattle and ostriches have died from poverty, and several stock owners have been compelled to remove their cattle out of the district in search of pasturage. Happily no diseases have been reported amongst stock. A few small swarms of locusts have visited the district, but it is hoped that, owing to the lack of vegetation, they will not remain. The outlook for the winter is gloomy in the extreme.

Steytlerville.—Rain has fallen over the greater part of the district. Only a few farms have not had any rain. Where it had fallen, at most two inches, the veld looks better than it has done for years, except a strip a flight of locusts has bared. Cattle and goats are in good condition, the only sickness being the Geelziekte. A good deal of ploughing has been done and it is hoped that the entire loss of last season in many places will be repaired.

Van Rhynsdorp.—Only a few showers have fallen here during the past month. Little ploughing has been done up to the present. Veld very dry, and stock of all sorts in very poor condition.

TRANSKEI.

For the month ending 30th April, 1905.

Bizana.—Very little rain fell during the month, and in latter part very hot weather has prevailed causing the grass to wither. Although this is so, a fair harvest may be expected Stock of all kind are in good condition. Horsesickness has made its appearance and many horses have been carried off and this will continue until the first frosts. No other disease amongst stock has been reported except the usual cases of gall sickness which at this time is prevalent.

Cofimvaba.—During the past month 2·72 inches of rain fell and the pasturage is in good condition in consequence, and all stock look well. The crops, which owing to the drought in the early part of the season were so backward, are much benefited by the rains since the commencement of the year, and should early frosts keep away more grain will be reaped than was anticipated. All areas quarantined on account of redwater or lungsickness, have been released, and no further outbreak has been reported during the month.

Flagstaff.—This month has been rather dry and the crops in some parts are ripening fast. The pasturage is still good and stock in excellent condition. Horsesickness has been severe in the lower parts of the district; the natives have lost heavily.

Idutywa -During the early part of April, we had good rains. Since then the weather has been beautifully fine. All stock are in good condition, and the pasturage is excellent. We require more rain so that the streams may have water during the winter months.

Kentani.—There is little to add to my report for March. Seasonable rains and weather prevailed during April, tending to improve the growing crops. Swarms of locusts in the the crawling stages have been discovered on the coast belt. These the natives have been busy in destroying in various ways, and I do not anticipate that many will get away on the wing. Tha pasturage is very good.

Libode.—During the first part of the month there was a fair rainfall but during the second half there was little or no rain Throughout the month horsesickness was very virulent and carried off a great number of horses. All other stock in a very healthy condition.

Lusikisiki.—There has been no rain this month. Weather dry and hot. Veld requires water badly. There are prospects of a fair harvest in mealies and Kaffir corn. Slaughter cattle in good condition. There has been a heavy mortality amongst horses from horsesickness, numbers dying daily. Small stock in good condition; no sickness reported.

Matatiele.—The rainfall during last month, was below the average, registering only one inch, and the veld has suffered a good deal from the dry weather. No frosts to speak of having yet fallen, and late crops have come on much better than was anticipated two months ago. Nevertheless many lands will come to nothing beyond providing food for stock in winter. Large fields of turnip sown for winter feed are promising to turn out well. All stock are in good condition. Numerous cases of redwater were dealt with and mostly traceable to transport from Natal. The Agricultural Society's Annual Show on 3rd May is being looked forward to with interest.

Mount Ayliff.—Weather fine and warm. Veld in good condition. Three inches of rain has fallen during the month. Mealies are very backward, and only a small crop is expected. Cattle are in good condition. There are several cases of lungsickness, all of which have been quarantined. Inoculation is being extensively carried out. Horses, etc., in good condition. Sheep and goats looking well.

Mount Currie.—There is nothing fresh to report this month. Crops on the whole looked well. Cattle, horses, and small stock are in good condition. No disease was reported. The weather has been fine for this time of the year. Nice showers tell at intervals during the month. There has been no frost to speak of.

Mount Frere.—The weather has been seasonable. So far there has been no frost, and the crops have had a chance to ripen. Several good showers of rain fell during the month, and the veld is in excellent condition for this season of the year. Stock of all kinds are in good order to begin the winter. There is little or no disease, and no fresh cases of lungsickness or glanders. Slaughter stock are plentiful and fetching fair prices, with a downward tendency in cattle, the price having dropped from £2 10s. to £1 10s. per 100 lbs.

Ngqeleni.—Very little rain has fallen during the past month, and in consequence the grass is becoming parched and dry, though still fairly good for stock. The disease amongst the horses appears to have abated to some extent, owing chiefly, I think, to the scarcity of the horses, two locations in this district being without a single native horse. Other stock are doing fairly well. Mealies along the Coast are yielding good crops, and are now being reaped, while those further from the sea are more backward and not so good.

Port St. John's.—An average rain has fallen here this month, and veld is consequently in excellent condition. Locusts are still about, although a good many have been destroyed by spraying. Weather at present cool. Mealies and Kaffir corn are yielding heavy crops in the river valleys, but poor at higher levels. Horse-sickness is decimating horses all over the district. Some locations have practically no horses left. Mules on post routes dying daily.

Qumbu.- The weather during the past month has been very favourable to the growing crops and, provided the frost keeps off, a fair harvest may be anticipated. Stock of all kinds are in good condition and with the exception of a few cases of lungsickness, free from disease. Pasturage is abundant and good.

Tabankulu. The prospect for mealie and millet crops varies a good deal; in some parts it is excellent, and in others I fear little will be reaped. This is due to the uneven nature of the rainfall. There has been a good deal of gall sickness due to the rich pasturage which succeeded the long drought.

Tsolo.—Fair rains continued to fall during the past month and the veld is good. No cases of lungsickness were reported during the month, but there have been several cases of horse sickness and redwater throughout the district. Stock, otherwise, is in good condition to start the winter.

Tsomo.—The absence of rain is injuring the pasturage, and the veld already presents a dry appearance. Frosts have been absent, and the mealie crops have had a better chance than was at first anticipated and, if it can be hoped that we shall be free during May, there is a possibility of the grain ripening. The weather during April was conspicuously mid-summer like. Redwater is not so prevalent, although one case of glanders occurred in the lower part of the district, but was fortunately located in a portion of the country free from horses. It has been shot, and there is every hope that no other cattle have been infected.

Umtata.—With the exception of horses, stock of all kinds appear to be free from disease and are in excellent condition. Horse sickness has made its appearance in several parts of the District, causing great anxiety among horse owners. The few crops of mealies and Kaffir corn which escaped the drought look promising. Should they ripen in time to escape the next frosts a small yield may be expected.

Willowvale. Stock on the whole are in very fair condition. One case of lungsickness and several of quarter evil have been reported: but owing to the stringent steps taken I do not anticipate any spread. No alteration in the value of stock. Mealie crop is progressing fairly well. Kaffir corn crop is a failure. During the month considerable rains fell, but towards the end the weather has been dry and hot. Notwithstanding the strenuous efforts made to check them, locusts are devastating lower portion of the district.

NOTES ON THE WEATHER OF APRIL, 1905.

By Charles M. Stuart, B.Sc., Secretary to the Meteorological Commission.

Exceptionally calm, bright and sunny weather, with temperature above the average, an unusually large number of thunderstorms, some of very wide extent, and frequent fogs of fairly general distribution, some light frosts and a mean rainfall of about three quarters of the usual amount were the leading features of the weather of last month

Precipitation. The average rainfall for last month, as shown by 346 rain-gauges distributed over the country, amounted to 1·52 ins. falling on 4 days, being 0·46 in. or 23 per cent. under the normal. That this deficit was almost general is shown by the subjoined table, from which it will be seen that there was an excessive precipitation only over the South Coast, where it was about double the usual quantity together with a slight surplus in Kaffraria and the South-East. The deficiency in rainfall was greater in the West and South-West, Basutoland, Rhodesia, the Northern Border and Natal, the Karoo, portions of the High Veld, including the Orange River Colony, having slightly more than half the average. As a result of the exceptionally severe drought it has been impossible to carry on ploughing operations during the month, while the grass on the veld is reported as being very short. A summary of the totals for the month, shows that although only 29 out of 346 stations had no rainfall, 140 had a precipitation of 1 inch or less; while 86 had 1 to 2 ins.; 46 had between 2 and 3 ins.; 20 between 3 and 4 ins.; of the remaining 25, situated chiefly along the South Coast, in the South East and Kaffraria; 17 had from 4 to 6 ins.; 5 from 6 to 7 ins.; one, each, 7 to 8, 9 to 10 ins., the list being headed by Vogel Vlei with 12·68 ins., Geelbock's Vlei

Division.	Mean Rainfall (1905).	Mean No of Days.	Average Rainfall. (1891-1903).	Average No. of Days.	Actual Differences from Averages.	Percentage Differences from Averages.
	Ins.		Ins.		Ins.	Percentage
Cape Peninsula	0·32	2	2·66	7	− 2·34	− 88
South-West	0·10	1	1·98	5	,, 1·58	,, 80
West Coast	0·01	1	0·89	4	,, 0·88	,, 99
South Coast	3·97	5	2·08	6	+ 1·89	+ 91
Southern Karroo	0·61	2	1·17	3	− 0·56	− 48
West Central Karroo	0·51	3	0·92	3	,, 0·41	,, 45
East Central Karroo	0·96	5	1·08	1	,, 0·12	,, 11
Northern Karroo	0·85	4	1·41	4	,, 0·56	,, 40
Northern Border	0·56	3	1·46	4	,, 0·90	,, 62
South-East	2·57	6	2·46	7	+ 0·11	+ 5
North-East	1·70	6	1·84	6	− 0·14	− 8
Kaffraria ..	2·49	7	2·34	7	+ 0·15	+ 6
Basutoland	0·23	6	2·42	7	− 2·19	− 90
Orange River Colony	1·19	5	1·95	5	,, 0·76	,, 39
Durban (Natal)	0·89	7	2·89	..	,, 2·00	,, 9
Bechuanaland	1·06	4	1·96	6	,, 0·90	,, 6
Rhodesia ..	0·10	1	1·43	4	,, 1·33	,, 3

being second with 9 to 10 ins. The maximum falls in 24 hours during the month were mostly under one inch, but some exceptionally high records were reported chiefly from the South Coast; analysing these we find that of 311 stations (excluding those with "Nil") 239 had maxima of 1 inch or less in 24 hours, and 41 had between 1 and 2 inches, only 16 having 2 to 3 inches, and 12 from 3 to 4 inches; the remaining six were the following:- East London East and Blauwkrantz with 4·10 inches each on the 11th and 9th respectively; Geelbeck's Vlei with 5 inches; Cape St. Francis with 5·25 inches; Witte Els Bosch, 6·91 inches, all on the 9th; but the record fall was 10·37 on the same date at Vogel Vlei.

The greater part of the month's precipitation took place with *Thunderstorms* which were reported from 395 stations on 23 days of the month; from this statement, taken in conjunction with the average number of rain days in each division, it will be readily understood that these storms were mostly very localised, the most marked exception was that series of thunderstorms occurring on the 9th, when they extended from the neighbourhood of the Cape Peninsula along the South Coast over the Karroo to Kokstad, Port St. John's in the East, and from Triangle as far North as Vryburg; those on the 8th, 18th and 19th were also fairly widely distributed, but over a much more limited area. *Hail* fell at 36 places on 11 days, chiefly the 9th, 13th and 20th, whilst *Sleet* was noted on 4 stations on 4 days. No *Snow* was reported.

Temperature, Cloud and Wind.—The mean temperature of all the stations during last month averaged 65·0°, or only 2·1° less than March, and 1·5° higher than the average, the mean maximum being 76·2°, and the mean minimum 53·8°, showing a mean daily range of 22·4°. Temperature appears to have been considerably above the average all over the country, both days and nights being much warmer than usual; the excess of the means for the months over the averages were exceptionally high, being 1-2 degrees along the coasts in the South-West and South, but rising to 4 degrees at the inland stations; this excess was mainly due to exceptionally high temperatures (4-7 degrees warmer than usual), although the night minima were also above the average by about 1 degree, rising to 3 and 4 degrees in the South-East. The only exceptions to this unusual warmth were the stations at Ceres and East London, which were more than a degree cooler than usual. The mean warmest station was Kenhardt, with 70·6°, and the mean coldest, Ceres with 57·1°.

The highest mean maximum of 86·5° was also recorded at Kenhardt, and the lowest mean minimum of 57 4° at Ceres. The warmest days were those of the 4th, 6th, and 26th-28th, the extreme maximum of 98·0° being registered at Groot Drakenstein on the 27th, and at Mossel Bay and Heidelberg on the 28th; the coldest mornings were those of the 2nd to 4th, 23rd to 25th and 27th, the absolute minimum of 30·0° being registered at Hopefield on the 24th; the mean of the absolute maxima averaged 89·3°, and of the corresponding minima 44·6°, showing a mean monthly range of 44·7°, the extremes for the month showing a range of 68°.

Frost was reported on the 14th, 17th, 18th, 23rd to 28th, but chiefly on the 27th.

Cloud.—The mean obscuration of sky during the month was 39 per cent., or 4 per cent. less than March last; the cloudiness for the month averaged about 40 per cent. over the Cape Peninsula, but increased to 55--60 along the South Coasts; inland it ranged mostly from 20 to 30 per cent., being least (10 per cent.) at Hope Fountain, and greatest (68 per cent.) at Cape L'Agulhas. *Fogs* or *Mists* were particularly frequent and persistent throughout the month, being reported from 197 stations in all, on every day of the month, but chiefly on 12th to 14th and 18th to 20th.

The *Winds* throughout the month were mostly light and variable, southerly in the South-West, with frequent calms all over the country, and a tendency to a prevalence of northerly and westerly winds in the East.

The mean force on the Beaufort Scale was 1·56, corresponding to a mean velocity of 10·8 miles per hour. Strong winds were reported on three days from five stations; hot winds were of daily occurrence from 21st to 30th, being reported from altogether 30 stations on eleven days; dust storms were experienced on 2 days.

OBSERVERS' NOTES.

VRUCHTBAAR.—Very dry, cannot do any ploughing.

DASSEN ISLAND.—During the month there was 68 hours and 50 minutes day fog and 70 hours and 30 minutes night fog. The fog around the coast seems to be increasing. Sadly in want of rain, practically without water.

BOSCHFONTEIN.—Weather very mild during the month. Winds light and variable.

WAVERLEY.—Only showers this month, except 0·57 on the 9th. No rain to fill dams since the 28th of February, and not enough rain to plough with, up to date.

Pella.—Very promising weather during the month; no rain on the place, but fair ones in the vicinity. Frequent thunder and lightning, especially during nights Wind blowing chiefly from N.E. to S.W. Good grass all over the country at the beginning of the month, but absolutely destroyed now by locusts.

Van Wyk's Vlei.—Veldt improved slightly, ploughing begins.

Carnarvon Farm The feature of this month has been an utter absence of winds—one windy day was recorded, and not much at that. No frosts, no cloudless days. Good soaking universal rains are much wanted for the wheat and other straw crops.

Thibet Park.—Although rain fell on ten days, the country is still in a bad state, very little water and grass very short, but nice and green. The weather for the whole month simply perfect—bright and warm—only more rain wanted

Whittlesea.—No frosts during the month. This has not happened before within my recollection.

Elliotdale.—Several cases of horse-sickness during the month.

Kokstad. No prevalent diseases; country getting very dry; mealie crops likely to be damaged by pests.

Groot Drakenstein. Warm and very dry month; temperature, 3·4° above average for six years; rainfall, 3·39 inches below average last ten years (3·52 inches).

Potberg.—The rain which fell during the three days, 7th, 8th and 9th, appears to have been general over the whole district, and was the heaviest known for years It was of the greatest value to farmers for ploughing, &c.

Port Elizabeth.—During the last two weeks of the month an unusual amount of fog has been hanging along the coast from the West extending to the East and round the outside of the Bay.

Rust en Vrede —The month has been sultry and close, with hot dry winds and heavy gales and dust-storms at high altitudes, the atmosphere being quite red. The reduction of the supply of water from fountains has been sudden and remarkable, probably the hot dry winds conducing to this. Remarkable it has been for the vivid display of lightning in the N, NE, E and SE, more especially in the N and NE, generally observed from 7.30 p.m. to midnight. The weather has been favourable for drying tobacco and growth of lucerne, where it can be irrigated; but it has been a most trying month for young trees, which have all had to be protected from the scorching wind.

Sydney's Hope.—Rain badly needed for crops and veld.

Kokstad (The Willows).—Calm, bright weather mostly; occasional storms. Slight frost in district, 5°, but harmless. Grass good. One or two fresh cases of enteric in town.

Uitenhage Park —The chief feature of the month was the prevailing SE winds; on only nine occasions was the wind SW, and even then only remained in that quarter a short time on some days. Hot winds occurred on five days, viz, 16th, 24th, 27th, 28th, and 30th There were no frosts, and the maximum and minimum temperatures were both comparatively high. The rainfall was much larger than in the corresponding month of 1901 April, 1901 (0·08), April, 1905 (1·76).

TEMPERATURES, APRIL, 1905.

Stations.		Mean Max.	Mean Min.	Monthly Mean	Abs Max.	Date.	Abs. Min.	Date.
Royal Observatory	..	73·6	55·3	64·4	87·0	27	38·9	24
Simon's Town ..	..	75·9	58·8	67·4	91·8	27	52·3	24
Blaauwberg ..	..	68·5	54·7	61·6	80·0	27	47·0	21
Devil's Peak (C.T.)	..	70·7	56·8	63·7	87·0	27	50·0	24
Sea Point	..	72·2	55·5	63·9	83·5	28	46·8	24
Wynberg ..	..	76·2	54·6	65·4	93·2	27	45·5	24
S.A. College (C.T.)	..	76·8	54·6	65·7	90·0	27	46·0	24
Groot Constantia	..	74·1	54·3	64·2	93·0	27	47·0	25
Ceres ..	..	69·7	45·1	57·4	80·0	9	32·0	25
Groot Drakenstein	..	81·6	53·5	67·5	98·0	27	40·5	25
Elsenburg (Agri. College)	..	78·0	52·6	65·3	94·8	27	44·2	3
Wellington ..	..	78·3	55·7	67·0	90·0	27	42·0	25
Hopefield ..	..	80·6	49·1	64·9	94·0	25	30·0	24
O'okiep ..	..	82·6	56·0	69·3	88·1	27	47·0	22
Cape St. Francis	..	67·9	57·7	62·8	94·0	28	51·0	3
Concordia (Plantation)	..	70·7	57·0	63·8	94·3	27	49·5	3
Storms River ..	..	73·9	54·4	64·2	95·0	28	45·0	3
Mossel Bay ..	..	72·2	58·2	65·2	98·0	28	47·0	2
Heidelberg ..	..	77·2	57·1	67·1	98·0	28	47·0	3
George (Plantation)	..	71·7	55·2	63·5	91·0	27 & 28	47·5	3
Cape L'Agulhas	..	68·8	59·1	63·9	88·0	28	52·0	24
Van Staaden's ..	..	77·1	57·2	67·2	94·0	27 & 28	46·0	3
Port Elizabeth	..	72·4	59·3	65·8	94·0	28	52·0	1
Rust en Vrede ..	..	78·4	54·2	66·3	93·0	28	43·0	3
Amalienstein ..	..	81·3	53·9	67·6	95·0	28	43·0	24
Somerset East ..	..	78·9	53·4	66·2	89·7	26	41·4	3
Graaff-Reinet ..	..	82·8	56·8	69·8	93·5	6	46·0	3
Steynsburg ..	..	74·2	49·6	61·9	84·5	5	43·0	3
Wagenaar's Kraal	..	77·2	49·7	63·4	86·0	5	42·0	23
Murraysburg ..	..	79·0	47·5	63·3	89·0	27	40·0	23
Hope Town ..	..	80·1	52·5	66·3	86·4	6	47·0	17
Kimberley ..	..	83·1	52·4	67·7	89·0	17	45·2	10
Kenhardt ..	..	86·5	54·7	70·6	93·0	4	45·0	23
Sydney's Hope ..	..	77·7	57·3	67·5	93·0	26	47·5	21
King William's Town	..	82·1	56·0	69·0	95·0	4, 6 & 28	45·0	2
Lovedale ..	..	80·0	56·4	68·2	92·0	8	45·0	3
East London, West	..	70·1	59·9	65·0	78·0	26	54·0	4
Grahamstown ..	..	78·1	54·2	66·2	93·9	26	42·1	3
Stutterheim ..	..	75·6	55·7	65·6	86·0	4 & 6	44·0	3
Rietfontein (Aliwal North)	..	71·3	46·5	58·9	78·1	5	39·7	10
Aliwal North ..	..	75·4	47·6	61·5	81·5	5	42·0	15 & 18
Main ..	..	74·2	53·8	64·0	85·5	1	46·0	21
Matatiele ..	..	76·3	47·5	61·9	81·9	29	39·2	27
Umtata ..	..	78·5	51·6	65·1	88·0	1	42·0	27
Port St. John's ..	..	78·1	61·8	69·9	86·0	6	54·0	27
Kokstad (The Willows)	..	73·6	46·5	60·1	81·0	24	37·0	27
Mohalies Hoek ..	..	72·5	46·7	59·6	79·0	5	39·0	15
Moyeni Quthing	..	76·2	43·3	59·7	89·1	1	35·0	10, 11 & 12
Hope Fountain	..	79·2	52·3	65·8	83·3	12	48·8	20 & 25
Means ..	..	76·2	53·8	65·0	98·0	..	44·6	..
Extremes ..	..	..	..	..	98·0	27 & 28	30·0	24

RAINFALL, APRIL, 1905.

CAPE PENINSULA:	INCHES
Royal Observatory, (*a*) 12 inch gauge	0·51
Cape Town, Town House	0·00
Do South African College	0·01
Do Sea Point (Hall)	0·09
Do do. (Attridge)	0·04
Do Molteno Reservoir	0·17
Do Platteklip	0·28
Do Signal Hill	0·03
Table Mountain, Disa Head	0·75
Do Kasteel's Poort	1·01
Do Waai Kopje	1·07
Do St. Michael's	1·20
Devil's Peak, Block House	0·45
Do Nursery Gauge	0·40
Do Lower Gauge	0·37
Bishopscourt	0·39
Wynberg (St. Mary's)	0·18
Groot Constantia	0·30
Tokai	0·15
Simon's Town (Wood)	0·16
Do. (Gaol)	0·25
Blaauwberg Strand	0·05
Robben Island	0·04
Cape Point	0·06
Woodstock	0·14
Plumstead (Culmwood)	0·07
I. SOUTH-WEST:	
Eerste River	0·00
Klapmuts	0·11
Stellenbosch (Gaol)	0·00
Somerset West	0·03
Paarl	0·00
Wellington (Gaol)	0·02
Do (Huguenot Seminary	0·00
Groot Drakenstein	0·13
Tulbagh	0·00
Caledon	0·00
Worcester (Gaol)	0·30
Hex River	0·35
Lady Grey (Div. Robertson)	0·69
Robertson	1·20
Porterville Road	0·00
De Doorns	0·00
Robertson (Govt. Plantation)	1·00
Montagu	2·33
Danger Point	0·58
Vijgeboom's River	1·15
Elgin Plantation	0·95
Elsenburg Agricultural College	0·06
Roskeen	1·42
Vruchtbaar	0·00
II. WEST COAST:	
Klipfontein	0·00
O'okiep	0·02
Springbokfont (Gaol)	0·00
Concordia	0·00
Garies	0·00
Kersefontein	0·00
The Towers	0·08
Dassen Island	0·00
Malmesbury	0·02
Piquetberg	0·00
Van Rhynsdorp	0·00
Clanwilliam (Gaol)	0·01
Hopefield	0·00
Anenous	0·00
Zoutpan	0·06
Concordia (Kpapohl)	0·00
IV. SOUTH COAST:	
Cape L'Agulhas	1·01
Bredasdorp	2·65
Swellendam	3·26
Heidelberg	3·57
Riversdale	5·35
Geelbek's Vlei	9·10
Mossel Bay	2·48
George	4·67
Ezelzagt	3·75
Sour Flats	4·36
Concordia	3·88
Knysna	3·04
Buffels Nek	6·01
Harkerville	2·93
Plettenberg Bay	3·90
Blaauwkrantz	5·60
Storm's River	4·84
Witte Els Bosch	7·77
Cape St. Francis	5·99
Zuurbraak	5·19
Great Brak River	3·22
Van Staaden's (upper)	1·98
Uitenhage	1·73
Port Elizabeth (Harbour)	1·09
Tankatara	0·90
Shark's River (Nursery)	1·11
Do (Convict Station)	1·01
Grootvader's Bosch	4·10
Vogelvlei	12·68
Centlivres	1·23
Woodifield	4·32
Potberg	4·19
George (Plantation)	4·70
V. SOUTHERN KARROO:	
Touws River	0·25
Ladismith	0·85
Amalienstein	0·55
Calitzdorp	0·60
Oudtshoorn	0·36
Uniondale	0·80
Kleinpoort	2·03
Verkeerde Vlei	0·05

V. S. KARROO—*Continued*	INCHES
Bok River	0·23
Triangle	0·11
Pietermeintjes	0·00
Rust en Vrede	1·19
VI. WEST CENTRAL KARROO:	
Matjesfontein	0·00
Prince Albert Road	0·20
Fraserburg Road	0·10
Prince Albert	0·17
Zwartberg Pass	1·85
Beaufort West	0·58
Camfer's Kraal	0·68
Lower Nel's Poort	0·50
Baaken's Rug	0·46
Willowmore	0·66
Steytlerville	1·04
Krom River	0·72
VII. EAST CENTRAL KARROO:	
Aberdeen (Gaol)	1·22
Aberdeen (Bedford)	1·42
Aberdeen Road	1·23
Klipdrift, De Erf	0·99
Kendrew	1·29
Graaff-Reinet	0·85
Do (College)	0·84
New Bethesda	2·11
Roode Bloem	1·32
Buffelskloof	0·89
Glen Harry	1·39
Bloemhof	0·76
Patrysfontein	0·51
Toegedacht	1·57
Klipfontein	0·50
Cranemore	0·31
Pearston	0·28
Somerset East	0·78
Do. (College	0·65
Middleton	0·90
Corndale (Div. Aberdeen)	1·92
Middelwater	0·51
Walsingham	0·48
Arundale	0·62
Spitzkop (G.R.)	0·71
VIII. NORTHERN KARROO.	
Sutherland	0·00
Fraserburg	0·18
Carnarvon	0·43
Wagenaar's Kraal	0·29
Brakfontein	0·34
Victoria West	0·46
Britstown	0·42
Murraysburg	0·81
De Aar	0·44
Middlemount	0·00
Philip's Town	0·43
Boschfontein	1·23
Petrusville	0·51
Middelburg	1·55
Colesberg	2·48
Tafelberg Hall	0·70
Cradock	1·77
Steynsburg	0·77

VIII. N KARROO—*Continued*	INCHES
Steynsburg (Nesemann)	0·88
Tarkastad	1·54
Riet Vlei	1·52
Omdraai's Vlei	0·16
Varken's Kop	0·77
Culmstock	0·75
Doorskuilen	0·33
Hillmoor	0·87
Glen Roy	1·67
Wildebeestkooij	1·01
Maraisburg	0·77
Loxton	0·86
Waverley	1·32
Scorpions Drift	0·50
Montagu	1·13
Rietfontein (Cradock)	1·88
Schuilhoek	1·04
Arundel	0·51
IX. NORTHERN BORDER:	
Pella	0·00
Kenhardt	0·38
Van Wyk's Vlei	0·40
Prieska	0·23
Dunmurry	0·31
Griqua Town	1·25
Douglas	0·59
Hopetown	0·91
Newlands (Div. Barkly West)	1·81
Kimberley (Gaol)	0·58
Do. (Stephens)	0·75
Barkly West	1·04
Upington	0·22
Trooilapspan	0·28
New Year's Kraal	0·40
Karree Kloof	0·23
X. SOUTH-EAST:	
Melrose	1·66
Fairholt	0·98
Cheviot Fells (Bedford)	1·66
Alicedale	0·75
Bedford (Gaol)	2·18
Sydney's Hope	2·21
Adelaide	1·34
Atherstone	2·41
Alexandria	2·87
Salem	1·93
Graham's Town (Gaol)	2·48
Do. (Bact. Inst.)	2·51
Heatherton Towers (near Graham's Town)	0·99
Fort Beaufort	2·01
Katberg	1·52
Balfour	1·16
Seymour	1·16
Alice	2·13
Lovedale	5·30
Port Alfred	1·56
Hogsback	2·64
Thaba N'doda	2·52
Peddie	2·60
Cathcart	3·31
Keiskama Hoek	0·00
Thomas River	2·96

X. SOUTH-EAST—*Continued*	INCHES
King William's Town	2·05
Do. Hospital	2 59
Stutterheim (Besté)	2·37
Dohne	2·59
Daggaboer	1·09
Blackwoods	0 95
Albertvale	1·62
Kubusie	1·74
Blaney	1·90
Kei Road	3·01
Evelyn Valley	5 40
Berlin	2·26
Isidenge	3·01
Perie Forest	2 68
Quacu Forest	1·83
Kologha	3·19
Fort Jackson	2·64
Komgha	3·31
Prospect Farm (Div. Komgha)	2·90
East London, West	5·30
Do East	6·87
Fort Cunynghame	3·12
Fort Fordyce	2·91
Lynedoch	1·70
Sunnyside	2·06
Crawley	2·66
Forestbourne	4·01
Chiselhurst	6·12
Cata	3·80
Wolf Ridge	2·35
Dontsah	2·23
Mount Coke	3·95

XI. NORTH-EAST:	
Venterstad	1·14
Ellesmere	1·51
Molteno Station	1·08
Cyphergat	1·08
Thibet Park	1·72
Sterkstroom	1·37
Rocklands	1·80
Aliwal North (Gaol)	1·88
Rietfontein	1·71
Hex's Plantation	2·47
Carnarvon Farm	1·93
Jamestown	1·03
Queenstown (Gaol)	1·87
Herschel	2·32
Lady Grey	1·73
Bolotwa, Contest	3·83
Lady Frere	2·72
Keilands	2·01
Barkly East	0 76
Lyndene	0·66
Mooifontein	1·60
Whittlesea	2·85

XI. NORTH-EAST—*Continued*	INCHES
Halseton	1·40
Storkspruit	0·89
Blikana	1·01
Table Hill	1·84
Hughenden	1·25
Glen Wallace	1·73

XII. KAFFRARIA:	
Slaate, Xalanga	2·02
Ida, Xalanga	3·52
Cofimvaba	2·72
Nqamakwe	3·15
Main	3·35
Engcobo	6·24
Butterworth	2·29
Kentani	5·82
Idutywa	2·74
Willowvale	5·07
Mount Fletcher	1·02
Elliotdale	2·60
Matatiele	1·01
Umtata	1·34
Kokstad	0·91
Port St. John's	2·91
Somerville (Div. Tsolo)	2·71
Tsomo	1·45
Bazeya	3·36
Cwebe	6·57
Seteba	0·52
Flagstaff	0·59
Insikeni	1·28
Mandileni	0·65
Cedarville	1·03
Kokstad (The Willows)	1·39

XIII. BASUTOLAND:	
Mafeteng	1·82
Mohalie's Hoek	1·61
Qacha's Nek	0·81
Moyeni Quthing	1·14
Maseru	0·96

XIV. ORANGE RIVER COLONY:	
Imperani	1·19

XV. NATAL:	
Durban, Observatory	0·89

XVII. BECHUANALAND:	
Vryburg	0·56
Mafeking	1·46
Taungs	2·06
Setlagoli	0·71
Zwartlaagte	0·51

XVIII. RHODESIA:	
Hope Fountain	0 05
Luscombe Farm	0·15

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 13th May, 1905, ruling at the several centres named, is published for general information :—

CENTRE.	A Wheat per 100 lb.	B. Wheat Flour per 100 lb.	C. Boer Meal per 100 lb.	D. Mealies per 100 lb.	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H Oat-hay per 100 lb.	J. Potatoes per 100 lbs.	K Tobacco (Boer Roll) per lb.	L Beef per lb	M. Mutton per lb	N. Fresh Butter per lb	O. Eggs per doz	P. Cattle (Slaughter)	Q. Sheep (Slaughter.
	£ s. d	£ s d.	£ s d	£ s. d	£ s d	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s d	s d	s d	£ s. d.	s d		
Aliwal North ..	0 12 0	0 14 0	0 13 6	0 7 9	0 9 0	0 10 0	0 9 0	0 7 6	0 11 0	1/6 to 4/-	0 9	0 7	0 1 0	2 9	£12	20 -
Beaufort West	0 11 6	0 16 6	0 12 9	0 9 0	0 12 6	0 10 0	0 7 6	0 5 6	0 9 0	0 0 7	6d to 11d	0 8	0 1 9	2 6	£17	26 6
Burghersdorp ..	...	...	...	...	...	...	...	...	0 9 0	...	0 7	0 7	0 1 3	3 3	...	...
Cape Town ...	0 9 9	0 12 4	0 11 0	0 6 9	0 8 3	0 6 6	0 6 4	0 4 0	0 9 6	0 0 8	0 10	0 10	0 1 6	2 0	£16 to £20	25/-
Clanwilliam .	0 11 3	1 10 0	0 12 3	0 15 0	...	...	0 10 0	...	0 10 0	0 4 6	0 8	0 8	0 2 0	1 6	...	...
Colesberg ...	...	...	...	...	...	...	..	0 7 0	0 16 0	...	..	0 6	...	3 0	.	...
Cradock ..	...	...	...	0 7 0	..	..	...	0 8 0	0 11 0	..	...	0 9	0 1 4	2 9	...	
Dordrecht ...	0 12 6	0 16 6	0 12 6	0 5 6	0 13 0	0 10 0	0 5 6	0 5 6	0 10 0	0 1 0	10d & 9d	5½d & 8d to 9d	0 1 3	3 0	£12 to £14	23
East London ...	0 13 0	0 15 6	0 13 0	0 7 0	0 10 6	0 7 0	0 11 6	0 7 0	0 10 0	0 1 6	0 9	0 8	0 1 5	2 11	£22	37 6
Graaff-Reinet ..	0 10 0	0 15 0	0 12 6	0 7 6	...	0 9 0	0 9 0	0 7 6	0 5 0	0 0 6	0 7	0 7	0 1 7	[illegible] 0	£15	25 -
Graham's Town	0 9 1	...	...	0 9 0	...	0 7 0	...	0 6 6	0 14 0	...	0 5¼	0 9½	0 2 3	3 1½	..	...
Kimberley ...	0 10 0	0 15 0	0 12 6	0 7 0	0 7 0	0 8 0	0 8 0	0 5 9	0 13 0	0 0 6	0 10	0 8	0 1 3	2 0	£13 to £15	15/- to 13 -
King Wm's Town	0 9 0	0 14 6	0 12 6	0 7 0	0 9 0	0 5 6	0 9 0	0 7 0	0 9 0	0 0 7	0 8½	0 8½	0 1 3	2 0	£14	22/6
Malmesbury ...	0 8 6	0 13 6	0 10 6	0 7 6	...	0 7 0	0 6 0	0 3 6	0 8 4	0 1 0	9d & 8d	0 9	0 3 0	...	£16	23 6
Mossel Bay ...	0 10 0	0 15 0	0 18 0	0 15 0	...	0 4 0	0 6 0	0 2 6	0 12 0	0 1 0	8d & 9d	8d & 9d	0 1 6	1 6	...	...
Port Alfred ...	0 12 6	0 19 0	0 15 0	0 7 6	0 13 0	0 6 0	0 10 0	.	0 10 0	0 0 9	0 9	0 10	0 1 6	2 0		...
Port Elizabeth ...	...	...	...	0 7 6	..	0 6 6	...	0 4 9	0 8 6	0 0 4½	0 7	0 7	0 1 9	2 9	..	.
Queen's Town ...	0 7 9	0 16 0	0 11 0	0 6 3	0 7 9	0 7 3	0 7 3	0 6 3	0 7 6	0 1 9	0 8	0 8	0 1 3	3 6	£15	22 5
Tarkastad .	0 12 0	0 12 6	0 12 6	0 12 6	0 12 0	0 12 0	...	0 8 0	0 15 0	0 1 0	8d & 7d	8d & 6d	0 1 6	2 6	£17	22/
Vryburg ...	0 11 6	0 17 6	.	0 6 6	.	0 12 0	0 9 0	0 7 6	0 8 6	0 1 9	...	..	0 1 9	1 9	£11 10s	20/
Worcester ...	0 10 0	0 16 0	0 11 0	0 5 0	0 9 0	0 7 0	0 6 0	0 4 0	0 7 0	0 0 6	0 5	0 9	0 1 6	1 6	..	..

NOTE.—A blank space denotes " no transactions

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal.*

Stock Farming; Artificial Grasses and Fodder for Stock; Ensilage; Dairying; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d); *Poultry Raising (1d.); Tobacco Cultivation by Schenck, (3d.); Tobacco Cultivation by Bornemisza (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); †Dairy and its Products by D. Hutcheon (2d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Citrus Psylla (1d); Fruit Fly (1d.); Fumigation Supplies (1d.); *Cyanide Gas Remedy for Scale Insects (3d.); †Hessian Fly (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d); *Peach Yellows (1d); Pear Slug, Paris Green (1d); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.): Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); Revised Plant Import Regulations (1d.); New Oak Tree Pest (1d.): Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d); Potato Tuber Moth (1d.); Treatment of Buildings with Hydrocyanic Acid Gas for Destruction of Vermin (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d); The Fruit Fly,* (with coloured plates) (3d.); *Gas Treatment for Scale Insects (3d.); Another Introduced Scale Pest (1d); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.): Cyanide Gas Fumigation (1d.); The Fruit Moth 1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); Elementary Principles of Sylviculture or Woodcraft (1d.) National Forests (1d.); Tree Planting (5d.); *Tree Planting for Farmers (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.)

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preservin Fish by Smoking (1d.)

Horticulture.

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.) Manual of Practical Orchard Work at the Cape (6d); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d) Netting for Fruit Trees (1d.)

Veterinary and Animal Industry.

*Anthrax, Charbon, Mitzbrand or Miltziekte (1d.); Diseases of the Horse and thei treatment (1s); Horse Sickness (2d.); *Heartwater (1d); *Liver Diseas among Calves (3d.); Lungsickness of Cattle (1d.); *Lampas (1d.); *Malarial Catarrhal Fever of Sheep (1d); *Preventive Vaccination against Anthrax and Swine Fever (1d); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Red-water, Anthrax and Quarter Evil (1d.); *Scab and its Nature (3d.); *Sheep and Wool (1d.); Treatment for Worms in Domestic Animals (1d.); †International Conference of Sheep Breeders (1d.); The Eye and its Diseases (1d.): Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Heartwater in Calves (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d); African Coast Fever with Description of Dipping Tank (3d.); Notes on the so-called Paralysis Tick (1d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.) —*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.) - *coloured plates.*

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1d.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.): *Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c.; Transvaal Plant Import Regulations (1d.)

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† Dutch only.